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U.S. Public Health Service
Annual report

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ANNUAL REPORT
OF THE
SURGEON GENERAL *of the*
PUBLIC HEALTH SERVICE
of the UNITED STATES

70th
FOR THE FISCAL YEAR

1941



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1941

LETTER OF TRANSMITTAL

FEDERAL SECURITY AGENCY,
OFFICE OF THE ADMINISTRATOR,
Washington, January 3, 1942.

SIR: In accordance with United States Code, title 42, section 4, I have the honor to transmit herewith the report of the Surgeon General of the Public Health Service for the fiscal year 1941.

Respectfully,

PAUL V. McNUTT,
Administrator.

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

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ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE

UNITED STATES PUBLIC HEALTH SERVICE,
Washington, D. C., October 15, 1941.

SIR: In accordance with the act approved July 1, 1902 (U. S. C. title 42, sec. 4), I have the honor to submit for transmission to Congress the seventieth annual report of the United States Public Health Service, for the fiscal year ended June 30, 1941. Included for the first time are the reports of St. Elizabeths Hospital and Freedmen's Hospital which have completed their first year of operation under the jurisdiction of the Public Health Service.

The yearly reports of the Public Health Service reflect the state of the Nation's health and the concurrent advance of science and of governmental responsibility. The specific duties imposed by Congress bring the Service into an increasingly close relationship with the well-being of every citizen. The partnership with the State and Territorial health authorities and the cooperative undertakings with other Federal agencies, professional bodies, and scientific institutions necessitate that the Public Health Service be responsive to the problems, needs, and achievements in the field of public health.

PUBLIC HEALTH AND NATIONAL DEFENSE

This year has subjected health organization in the United States to a crucial test. Problems created by the national emergency have overshadowed all other considerations. They pose the question: Will health services at Federal, State, and local levels meet successfully the shift from peacetime requirements to wartime needs? The pages of this report present in detail the problems encountered and the ways in which they are being met.

During recent years, the Public Health Service has been strengthened; cooperation with State and local health organizations has matured and extended; the foundations have been laid for a health service truly national in scope. Without such a foundation, health organization in the United States would have been ill-prepared to meet the current great needs of military and industrial defense.

Every branch of the Service has felt the impetus of the emergency. Research has been shifted to problems of war medicine: Industrial hygiene, aviation physiology, tropical diseases, chemotherapy, and typhus fever present acute problems of defense importance. There has been a need for more nurses. A shortage of doctors impends. Sanitary engineers, laboratory technicians, and other health personnel are insufficient. Military and "Lend-Lease" priorities have created a scarcity of innumerable articles needed in the manufacture of drugs, vitamins, medical and health supplies. There has been an increased demand for vaccines, antitoxins, and serums. Our chemists are seek-

ing substitutes for threatened overseas supplies of opium and quinine. The burden of health defense, however, has fallen most heavily upon the Federal-State cooperative programs for general public health services, venereal disease control, and industrial hygiene.

During the 5½ years of operation of title VI of the Social Security Act there has been a sound and steady growth of basic health services throughout the country. By 1940, more counties and cities were served by health units under the direction of a full-time medical officer than ever before. Existing services have been strengthened. More public health nurses were employed. More venereal disease patients were brought under treatment. The attack on all preventable sickness and death has become sharper and surer. All along the public health front there has been marked progress.

This hardy growth has been gratifying but it has not been sufficient to meet the emergency demands of 1941. Military camps and industrial developments have brought large concentrations of people into hundreds of communities. No great amount of public health foresight was needed to know that, in many areas, local authorities would not be prepared to cope with the problems bound to arise. Basic sanitary facilities and communicable disease control were inadequate among vastly increased populations. In a word, the States needed greater Federal help in defense areas.

In the summer of 1939, the Public Health Service undertook sanitary reconnaissance work in Army maneuver areas and later extended it to areas of mobilization and industrial expansion. Teams consisting of a medical officer and an engineer have surveyed the public health, housing, hospital, and medical facilities of 250 such areas, securing first-hand information on the health status and needs for Federal assistance.

Early in the emergency, many State health departments were compelled to take personnel away from normal duties and assign them to critical areas, but still additional personnel were needed. It was clear that the already overtaxed staff of the Public Health Service could not meet the demand. On March 1, 1941, Congress made available the sum of \$525,000 to provide personnel and facilities in critical defense areas during the remaining months of the fiscal year. By June 30, 1941, 104 trained physicians, engineers, nurses, and technicians had been assigned to this duty. An in-service training course, lasting 6 weeks, was organized to acquaint each group of recruits with the particular problems in defense areas.

Progress of recent years in the control of syphilis and gonorrhea gives us an advanced position from which to proceed against these diseases. Venereal disease is and always has been a major problem in military forces. Gonorrhea is a leading cause of days lost from service in the United States Army. Syphilis and gonorrhea together cause as much lost time in the Army as the next three leading causes combined. In the Navy these diseases are responsible for the second greatest loss of time from duty.

In 1940, officials of the Army, the Navy, the Public Health Service, and State health departments signed a working agreement¹ for the control of venereal disease in extra-cantonment areas. The State health departments, with the cooperation of the Public Health Service,

¹ See Appendix B, p. 205.

agreed to prosecute the control of venereal disease in civilian populations contiguous to military camps. The Army and the Navy agreed to supply information on contacts of infected military personnel to local health authorities. Treatment of military and naval personnel, of course, is provided by the Army and the Navy.

Prostitution complicates the control of venereal disease in practically all defense areas. The United States Public Health Service has cooperated with the American Social Hygiene Association in a study of prostitution in defense areas. The policy of Federal and State health authorities and of the Army and Navy has been to seek the repression of prostitution in extra-cantonment areas. Here the responsibility rests with local police authorities. Support of this policy was given in the passage by Congress of the May Act (H. R. 2475), authorizing the Secretaries of War and Navy to prohibit prostitution within "such reasonable distances of military and/or Navy establishments as are determined to be needful to the efficiency, health, and welfare of the Army and Navy."

Upon the recommendation of the Public Health Service and the State and Territorial health authorities, the Selective Service System adopted the routine blood testing of all registrants called for physical examination. The tests were made in the State laboratories. The Public Health Service undertook to tabulate the results of the serologic tests and of physical examinations for syphilis and gonorrhea. Preliminary reports indicate that clinical syphilis rates are much lower among the first million men examined in 1940 than in the first million examined in 1917. The data reveal a wide variation in the prevalence of venereal disease from State to State. Detailed analysis of the information should provide the most accurate guide ever obtained for an all-out attack on venereal disease.

It is not enough to discover venereal infection in the young men of the Nation. The State health departments, insofar as funds are available, are following up those men found to have positive blood tests or other evidence of venereal disease. Those found infected are placed under treatment. After they have received the maximum benefit from treatment, they are referred to their local Selective Service boards for reexamination.

The Army and Navy experience strikingly demonstrates the need for emphasis on gonorrhea control in the civilian population. Since this disease may be acquired repeatedly it is often a recurrent cause of disability and, therefore, results in a significant economic loss to industry. Public health authorities now have the means for mass control of gonorrhea. Research by the Public Health Service has proved that the sulfonamide drugs provide quick, safe, and effective chemical control. Yet local diagnostic and treatment service for gonorrhea has lagged.

Just prior to the close of the fiscal year, a venereal disease control program in representative defense areas was planned in cooperation with the Work Projects Administration. The objective is to evaluate methods of venereal disease control in selected areas, including urban communities of varying population sizes and rural communities. The project will function in collaboration with local venereal disease control authorities. Special emphasis will be placed on the follow-up and treatment of contacts of military and industrial personnel.

Even in normal periods the loss of time due to disability of all types in industry amounts to 350 million days a year, considerably more than

one million work-years annually. This is the greatest single factor slowing up the production schedule. In 1940, disability cost 50 times the loss due to strikes and walk-outs. To an increasing extent, able-bodied trained men are being drawn into military service. They are replaced by less experienced younger men, by women, and by older workers. The stage is set for a rise in accident and disease rates. If we are to win the war through the production of war materials, we cannot afford even the normal loss of productivity.

Industrial disability, whether caused by occupational exposure or nonindustrial disease, can be reduced. However, application lags far behind our knowledge. Prompt institution of medical and engineering control throughout industry would immediately reduce by 10 percent the time lost due to sickness and accidents. This share of the total disability is due to occupational diseases and accidents which we know how to control. A still greater saving can be made if *all* public health facilities are directed toward the nonindustrial sickness problems of the worker. Control of tuberculosis, venereal disease, and other communicable disease should be intensified in the industrial population. Through better nutrition much can be done to promote the general health of workers.

By continuous research and promotion of industrial hygiene services, the Public Health Service has, over a number of years, laid the basis for an industrial hygiene program. As late as 1935, however, only 6 States had functioning industrial hygiene services. The provisions of title VI of the Social Security Act gave the first Nation-wide impetus to industrial hygiene. In 1941, 32 States and 4 large cities had industrial hygiene units. About two-thirds of the \$800,000 budgeted from all sources for industrial hygiene work in 1941 was derived from title VI funds. Despite this good start, industrial hygiene services in most States were extremely thin; the units suffered acutely from lack of personnel and equipment. Nevertheless, a sound foundation had been laid.

In February 1941, the subcommittee on industrial hygiene and medicine of the Health and Medical Committee designated the Division of Industrial Hygiene of the Public Health Service as the agency to coordinate all activities for the health protection of defense workers. The program developed and now in operation includes: the recruitment and training of professional personnel; the provision of industrial hygiene services in Government industrial establishments; laboratory and field research in the cause and control of occupational diseases; and aid to State industrial hygiene units. Under the leadership of the Service, the States are investigating hazards in defense industries; supervising plant construction and renovation, with a view to the provision of adequate sanitation and safety facilities; developing medical services in defense industries; and carrying on an educational program for the medical profession, management, and labor.

Public Health Service personnel have been assigned to 12 States to aid industrial hygiene service for defense industries. In addition, mobile teams of Service experts are prepared to render emergency assistance.

At the request of the Surgeon General of the Army, the Public Health Service is conducting systematic investigations of all industrial establishments of the War Department. Four mobile units, each

consisting of a physician, an engineer, and a chemist, are operating in arsenals, Air Corps stations, and Quartermaster Corps depots. Each establishment is carefully surveyed and recommendations are made for the correction of industrial hazards.

Research directly affecting defense activities includes studies on the toxicologic effects of explosives, solvents, and metals used in airplane construction and the manufacture of munitions; health hazards in the manufacture of synthetic rubber and plastics; and methods of control. In cooperation with the United States Navy, extensive research into the problems of aviation medicine is under way.

COOPERATION WITH OTHER DEFENSE AGENCIES

The Public Health Service is cooperating actively with numerous Federal defense agencies. The usual demands upon personnel and facilities of the Service by other Federal agencies have greatly increased during the emergency. If this agency is to play its full part in defense, a larger measure of support is needed. Appropriations to the Public Health Service for the fiscal year 1941 totaled \$22,379,340. Established functions of the Service, including foreign quarantine administration, operation of the marine hospitals, and conduct of essential research in diseases and stream pollution had to be financed. More than \$11,000,000 were allotted in grants-in-aid to the States.

On September 19, 1940, an Executive Order of the President created the Health and Medical Committee under the jurisdiction of the Council of National Defense. Membership of the Committee is composed of Dr. Irvin Abell, former president of the American Medical Association, Dr. Louis H. Weed of the National Research Council, and the Surgeons General of the Army, Navy, and the Public Health Service. On November 28, 1940, the Health and Medical Committee was transferred to the Office of Health and Welfare Services.

A medical officer of the Public Health Service has been detailed to act as executive secretary of the Health and Medical Committee. In this capacity he serves as liaison between the several subcommittees and Federal defense agencies. Other personnel of the Service provide consultation for the six subcommittees on hospitals, medical education, dentistry, industrial health and medicine, nursing, and Negro health.

At the request of the Nursing Council on National Defense, the Public Health Service, in cooperation with the subcommittee on nursing, undertook a Nation-wide inventory of registered nurses. These data will provide a national roster of the registered nurses available for various types of military and civilian duty. Preliminary analysis of the data revealed a serious shortage of nurses. Plans were immediately drafted to bring additional student nurses into training, to provide refresher courses for inactive nurses, and post-graduate training for nurses in service.

The Service has further assisted the subcommittee on hospitals in assembling the data on the need for the expansion of hospital facilities in defense areas where the influx of population overburdened existing facilities or where there were no hospitals.

Personnel of the Service have acted as consultants to the Selective Service Board in connection with the medical examination of registrants under the Selective Service Act.

In 1940, two medical officers were assigned to the National Youth Administration to develop and administer a health program for that organization. Further assistance is given by the district offices of the Service. Statistical supervision of the analysis of physical examination records has been provided.

The Public Health Service has also been active in the preliminary work leading to the initiation of the national nutrition program. The Service has been represented on the National Nutrition Advisory Committee and assisted in the organization and conduct of the national conference.

Twenty-two fellowships in public health and medicine were granted by the Public Health Service in 1940-41 to medical graduates from Latin-American countries. The selection of candidates has been made in cooperation with the Pan American Sanitary Bureau and the State Department. Recipients of fellowships included students from Argentina, Bolivia, Brazil, Colombia, Chile, Costa Rica, Cuba, Ecuador, Guatemala, Haiti, Honduras, Mexico, and Peru. Fellowships have been extended beyond the customary 12 months to permit 13 of the students to complete special studies. New fellowships are planned for students recommended by the national health authorities of Costa Rica, Uruguay, and Venezuela.

Regulations governing the granting of fellowships in public health and medicine were approved by the President on November 20, 1940. Since then, Latin-American students have enrolled at several U. S. Marine Hospitals, at the New York Post-Graduate Medical School, Massachusetts Institute of Technology, Harvard University, the University of Michigan, the Johns Hopkins University, the Phipps Institution, and Catholic University.

In January 1941 the Surgeon General was appointed by the President as a member of the special committee to study civilian defense in Great Britain. Public health and medical procedures under war conditions were observed in a number of cities. The United States is profiting much by the experience gained by the British in meeting wartime medical, health, and nutrition problems.

The most critical situation encountered by the British public health and medical services has been the shortage of professional personnel. The measures adopted by the British to maintain civilian medical and nursing services have, in several instances, been applied in this country. Medical students and internes are now permitted to complete their training before being drafted for military duty. Every effort is being made to increase the number of trained nurses available for active duty and volunteers are being trained to act as nurses' aides and nursing assistants.

An equally acute health problem for the British is securing adequate supplies of protective foods. This problem is being worked out under the Lend-Lease Act by an Anglo-American Food Committee. The Surgeon General is a member of this Committee.

At the request of the President, a medical officer has been assigned to the Office of Civilian Defense, and it is expected that additional personnel will be assigned during the next fiscal year. A program for emergency medical service is being developed in the Office of Civilian Defense.

Personnel of the Service have assisted the various Federal housing agencies in establishing standards for defense housing, in giving con-

sultation on the construction of health centers in public housing projects, and in surveying hospital needs and medical services in defense housing projects.

HEALTH LEGISLATION

The most important health legislation enacted during the year was designed to assist the Service in meeting the special problems created by the national defense program. As previously reported, the Seventy-seventh Congress in March 1941 appropriated more than half a million dollars for the provision of Public Health Service personnel and facilities to State health departments in critical areas. The regular appropriation to the Service for the fiscal year 1942 included a sum of \$1,235,000 for emergency health and sanitation activities. In a subsequent act, an additional \$1,940,000 was appropriated to expand these services. The Congress further appropriated \$1,250,000 to assist schools of nursing in training additional student nurses and in providing refresher courses and postgraduate training. The nursing training program and the allotment of these funds are under the administration of the Public Health Service.

The Community Facilities Act, passed on June 28, 1941, makes available to the Federal Works Administration \$150,000,000 "to provide means by which public works may be acquired, maintained and operated * * * in any area or facility where the President finds an acute shortage of public works necessary to the health, safety, or welfare of persons engaged in national defense activities."

Such public works include schools, waterworks, works for the treatment and purification of water, sewers, sewage disposal, garbage and refuse disposal facilities, public sanitary facilities, hospitals, and other places for the care of the sick.

Application for funds is made by communities to the Public Works Division of the Federal Works Administration. If the project relates to health or sanitation, it is referred to the Public Health Service. Extensive reconnaissance surveys made by the Public Health Service in defense areas during the past year make it possible in almost every case to clear an application within 24 hours. If a problem is particularly difficult, information is obtained from the field within a few days. Field personnel of the Service may also recommend needed facilities where the community is not equipped to do so.

Other legislation introduced in Congress but not passed at the close of the fiscal year would create a Federal Department of Health headed by a Secretary of Health; create a Division of Water Pollution Control in the Public Health Service; provide funds for construction of hospitals where needed in rural communities and economically depressed areas; authorize the Public Health Service to conduct research in the cause, diagnosis, and treatment of dental diseases; and impose additional duties on the Service in connection with the investigation, treatment, and control of tuberculosis.

NATIONAL NUTRITION

In the health field, the outstanding event in 1940 was the setting in motion of a national nutrition program. If it be carried out

fully, the American people will attain levels of health, vigor, and efficiency which have in the past been envisioned as unattainable.

At the request of the President, 900 experts from all parts of the country assembled in Washington, D. C., for the National Nutrition Conference in May 1941. The President asked the Conference to "explore and define our nutrition problems, and to map out recommendations for an immediate program of action."

The Conference charted the course to build a new America through the united efforts of agriculture, economics, public health, nutritional science, industry, and education. Scientific discoveries on many nutritional fronts were ready for translation into action. Enough basic facts were assembled to stimulate national thinking and speed action. The facts made clear that while nutrition is an individual and family problem, it is also a community and national problem.

The Conference drew up the specifications for a diet adequate for good health—a diet to be selected from a wide choice of natural foods that can be purchased anywhere in the country. New flour standards by which vital elements naturally present in wheat will be conserved were announced. The Conference further recommended continued scientific research in nutrition with greater support by Government, industry, and private institutions; the production of more of the foods we need for defense, less of those not needed; the extension of the food stamp plan or similar machinery to make available essential foods to nutritionally needy families; and finally, a Nation-wide program of nutrition education.

The Public Health Service has played an active part in planning for better national nutrition. Research is being extended at the National Institute of Health. Following the Conference, a survey of nutrition programs in several State health departments was conducted and recommendations made for the improvement and expansion of these activities. Study has been initiated on the relationship between marginal vitamin deficiencies and susceptibility to infection.

PROGRESS IN OTHER ACTIVITIES

While the work of the Public Health Service has been greatly conditioned by the national defense program, progress has been made in normal activities.

Two new buildings at the National Institute of Health, Bethesda, Md., were occupied during the year, completing the physical plant of the Institute. A Division of Chemotherapy in the Institute was created by merging the functions and personnel of the Division of Pharmacology, the Nutrition Unit of the Division of Chemistry, and the Chemotherapy Unit of the Division of Infectious Diseases. A unit for coordination of research in the field of gerontology was set up and a national advisory committee created. Research possibilities were surveyed at a meeting in Washington of the committee.

The tuberculostatic action of a large series of sulfonamide drugs and certain phosphorous analogues were tested against the human tubercle bacillus, strain H 37.

Substantial protection against whooping cough by use of a two-dose alum-precipitated pertussis vaccine developed at the National Institute of Health constitutes one of the most immediately practical

accomplishments during the year. The vaccine was tested in the field in cooperation with the Norfolk City Union of King's Daughters Visiting Nurse Association of Norfolk, Va. The data are adequate to form minimal estimates as to the amount and duration of such protection. This method is suitable for wide public health use. If a combination of the new pertussis vaccine with alum-precipitated diphtheria toxoid proves effective, immunization against these two serious diseases of infancy and early childhood could be accomplished with a single set of two injections.

A hyperimmune rabbit serum for the treatment of Rocky Mountain spotted fever was also developed. Present indications are that in the serum we have for the first time a useful therapeutic agent for this disease. Other research showed that, contrary to popular conception, there is little difference in the severity of Rocky Mountain spotted fever in Eastern States as compared to the Northwestern States, where it has long been thought excessively virulent. New foci of the infection were found in 62 counties in 18 States.

Typhus fever still shows a tendency to spread northward from its area of greatest prevalence—the Southern States. A laboratory test was developed which will differentiate typhus from other rickettsial diseases, particularly spotted fever.

The National Advisory Cancer Council recommended to the Surgeon General 15 grants-in-aid for cancer research in various hospitals and institutions. At the close of the fiscal year, 12 of these, totaling \$77,780, had been paid. Dr. Cornelius P. Rhoads and Dr. Edward A. Doisy were appointed to the Council, succeeding Dr. James B. Conant and Dr. Arthur H. Compton, whose terms expired.

Attention was focused on gastric cancer by a subcommittee of the Council at a conference in which some 50 scientists participated. The conference recommended a coordinated program of gastric cancer research in three institutions especially qualified to undertake the studies.

Among the numerous studies conducted at the National Cancer Institute, research on lung cancer revealed that benzene extracts of air dust collected at Boston and Pittsburgh, and from the exhaust of the New York Holland Tunnel produced sarcomas in mice at the site of subcutaneous injection. Dust from the Holland Tunnel is being analyzed for the purpose of isolating cancer-producing chemicals.

Inbred mice were subjected to tobacco smoke under carefully controlled conditions to determine whether the smoke can produce lung cancer. True carcinoma of the stomach was twice obtained in mice following the intramucosal injection of methylcholanthrene.

Cancer control programs were established in Arizona, New Mexico, Wyoming, Montana, and Idaho, bringing the total of State and Territorial cancer programs to 39. Consultation services were provided to these organizations and radium loans to 41 hospitals were renewed and loans were made to three other institutions. Approximately 2,000 patients were treated in these hospitals with Government-owned radium. Thirty-one trainees in the diagnosis and treatment of cancer were on the pay roll.

Improvements of the X-ray microfilm for diagnosis of tuberculosis were made during the year. A highly efficient portable photo-roentgen unit and new techniques have been tested in the field. It appears

that this method of obtaining roentgenographic evidence of tuberculosis will have an important place in future public health programs. Further studies of the tuberculin test indicated the need for careful regulation of dosage and potency of tuberculin.

At least \$150,000,000 of public funds is being spent annually for medical care of relief and low-income groups, largely without adequate medical direction or supervision. Unless health departments move toward supplying the medical direction and supervision needed, it seems clear that the public welfare agencies will soon obtain direction for themselves from some other source. Studies of the medical and hospital care provided for recipients of public assistance in New York, Minnesota, and Virginia reveal serious problems. Outstanding among these are needs for more rational administrative organization, better professional supervision, closer cooperation between the various agencies concerned, and more accurate recording of costs and volume of services. Indicated also is the need for amendment of the Social Security Act so that the Federal Government may match the sums expended by local and State welfare agencies in the form of direct payment to physicians, hospitals, and others who provide medical care to recipients of old-age assistance, aid to the blind, and aid to dependent children.

Quarantine measures have held the line against the importation of disease into the United States. Despite a large influx of refugees, traveling on vessels on which overcrowded and insanitary conditions prevailed, no case of quarantinable disease reached a United States port during the year. Owing to unusual prevalence of smallpox in Spain, vaccination or satisfactory evidence of active immunity to the disease has been required of passengers and crews embarking at Lisbon.

The United States Marine Hospitals and Relief Stations report increased activity attributed in great measure to national defense activities. Of the 77,317 in-patients treated during the year, 31,013, or 40.1 percent, were American merchant seamen, still the largest single group of beneficiaries treated by the Service.

Freedmen's Hospital provided a total of 12,926 days' hospital care and furnished 86,665 out-patient treatments during the fiscal year. In recognition of the high standards established and maintained at Freedmen's, the hospital has been approved by the American College of Surgeons for graduate training in general and special surgery.

The Public Health Service Hospitals at Lexington, Ky., and Fort Worth, Tex., established for the treatment of narcotic drug addicts, operated with increased emphasis on the rehabilitation of patients. The exigencies of the war at sea have reduced the amount of narcotics available in the illegitimate trade. As a result, the number of addicts committed to the hospitals has been materially reduced. These institutions can comfortably take care of 2,100 patients; at the present time, 670 beds are being utilized for the treatment of selected patients from St. Elizabeths Hospital.

St. Elizabeths Hospital operated with an average daily patient population of 6,663—an increase of 562 over that for the previous year. The number of admissions during the year was the highest since 1919, the year following the first World War. The discharge rate for 1941 was 51.5 and compares favorably with the rates for 1937, 1938, 1939, and 1940.

The enlargement of the Army, Navy, and Marine Corps increases the number of persons eligible for mental treatment at St. Elizabeths Hospital. The number of Army personnel who require mental treatment is increasing rapidly and if the emergency goes on into actual combat it is expected that the increase will be still more rapid.

MORBIDITY AND MORTALITY IN THE UNITED STATES

The provisional death rate² from all causes for the calendar year 1940 was 10.5 per 1,000 population. This was about 1 percent higher than in 1939 when the lowest death rate in the history of registration occurred.

The maternal mortality rate declined for the eleventh consecutive year. Only 15 of 41 States reporting had an increase over 1939. For the entire group the rate for 1940 was 3.6 per 1,000 births—about three-fifths the rate for 1936.

The 1940 infant mortality rate of 47 per 1,000 live births was the lowest on record. It represents a decline of 16 percent from the rate of 56 per 1,000 for 1936. There was a slight increase in the birth rate during 1940; available data for the first quarter of 1941 indicate that the upward trend will continue.

The 1940 death rate from automobile accidents was 24.3 per 100,000 population, the highest since 1937. Data for the first quarter of 1941 indicate an alarming increase in automobile fatalities; the rate increased 22 percent over that for the first quarter of 1940.

Especially noteworthy is the low mortality from influenza and pneumonia. Despite a widespread epidemic of influenza, the death rate from this disease was 14.8 for 1940 as compared to 16.4 for 1939. During the first quarter of 1941, however, the epidemic reached its peak and the death rate was 35 percent greater than for the corresponding periods in 1939 and 1940. The death rate from pneumonia in 1940 was 53.5 per 100,000 population as compared to 58.6 for the previous year. Even at the peak of the influenza epidemic the pneumonia death rate was about 8 percent lower than in the first quarter of 1940. Increased use of serum and chemotherapy continues to reduce deaths from this cause.

Diphtheria, measles, scarlet fever, and whooping cough—the four principal communicable diseases of early childhood—were responsible for about 25 percent fewer deaths in 1940 than in 1939. Measles became epidemic in the first quarter of 1941, however, and the death rate rose to 1.5 per 100,000, nearly four times the 1940 rate of 0.4 per 100,000.

The death rate from tuberculosis for 1940 was 43.8 per 100,000 as compared to 45.0 for 1939.

Cancer, cerebral hemorrhage, diabetes, heart diseases, and nephritis caused a larger proportion of the total deaths in 1940 than in 1939. Heart disease and cancer continued to take the highest toll, the rates being 288.9 and 117.8 per 100,000 population, respectively. Poliomyelitis and encephalitis were the only acute diseases causing relatively more deaths in 1940 than in 1939.

² Provisional rates are based on reports from 40 States and the District of Columbia.

The occurrence of epidemic diseases in the United States during the calendar year 1940 remained favorable except for an unusual prevalence of influenza and poliomyelitis. Reported cases of influenza numbered 426,851, 57 percent greater than the 1935-39 median of 271,771. A severe epidemic began in November 1940, in Arizona and California and spread eastward. The peak was reached during the latter part of January 1941, with six times more cases than at the peak in February 1940.

Nearly 10,000 cases of poliomyelitis were reported in 1940—a 33 percent increase over the 1935-39 median. The 1940 total was the largest since 1935. The North Central States and to a lesser extent the Pacific Coast States suffered the worst outbreaks. The New England and Middle Atlantic States reported relatively few cases.

An encouraging indication that basic public health services are improving in our communities was seen in a marked decrease in diphtheria, smallpox, and typhoid fever. Diphtheria cases numbered 15,515—about half the 5-year median of 30,018. The decrease in smallpox was even greater; 2,795 cases were reported in 1940 as compared to 9,877 for the 5-year median. As usual, the prevalence of smallpox was greatest in the West North Central and Mountain States which have resisted control measures. In contrast, no cases were reported from the Middle Atlantic and New England States, where control measures are observed.

Plague continues its threat. Despite continued warnings, the disease in rodents continues to spread eastward. One fatal human case was reported in 1940. State health departments, except for a few, remain apathetic.

During this past year, physical examinations of nearly a million young men registered for service in the armed forces revealed 43 percent physically unfit for general military duty. About 28 percent were rejected as unfit for any military duty. Some of the defects are correctible; most of them could have been prevented. But these men—our prime source of manpower—are being sent back into their communities untreated. The most common cause of rejection is defective teeth. Many of the rejectees have syphilis, a condition we know how to prevent and cure. And so it goes down the list of causes of rejection. American manpower is going to waste in the worst crisis in our history because of neglect of medical, dental, or surgical care.

Health authorities believe that men of military age with correctible defects should be treated—at public expense if necessary. Activities which might reduce the occurrence of such conditions should be intensified and the health organizations of this country should be utilized in such corrective work as may be developed as a part of the national defense program. The final benefit will not be limited to our armed services. It will accrue to our whole Nation in a healthier, more useful generation.

THOMAS PARRAN,
Surgeon General.

HON. PAUL V. McNUTT,
Federal Security Administrator.

DIVISION OF DOMESTIC QUARANTINE (STATES RELATIONS)

Assistant Surgeon General JOSEPH W. MOUNTIN in charge

The Division of Domestic Quarantine, organized in 1910, was originally concerned chiefly with preventing the interstate spread of communicable disease by the application of quarantine restrictions. It was soon apparent, however, that the spread of disease from one State to another could most effectively be prevented by assisting State health authorities to prevent communicable illness at the source. Accordingly, major emphasis was shifted from quarantine procedure to aid to States in developing adequate State and local health organizations. Increased importance was given to this phase of the Division's work by the enactment in 1935 of the Social Security Act which made Federal funds available to States and municipalities for augmenting health facilities. The Division, therefore, became known unofficially as the States Relations Division, and on July 1, 1941, this designation was officially adopted for the Public Health Service by direction of the Surgeon General.

THE COOPERATIVE PUBLIC HEALTH PROGRAM

The Social Security Act amendments of 1939 increased from \$8,000,000 to \$11,000,000 the amount authorized annually by title VI for grants-in-aid to States for establishment and maintenance of State and local health services. The full amount of the increased authorization, \$11,000,000, was available for the first time during the fiscal year ending July 1, 1941, an increase of \$1,500,000 over the amount available in the previous fiscal year.

The total amount of payments to States from title VI funds during the fiscal year 1941 was \$10,722,115.21. The distribution of this amount among the States is shown in table 1.

TABLE 1.—*Payments to States under sec. 601 of the Social Security Act for the fiscal year ended June 30, 1941*

State	Total payment	State	Total payment
Alabama.....	\$350,700.00	Nebraska.....	\$94,875.00
Alaska.....	41,110.70	Nevada.....	40,690.00
Arizona.....	74,600.00	New Hampshire.....	58,346.66
Arkansas.....	262,100.00	New Jersey.....	256,500.00
California.....	383,900.00	New Mexico.....	93,900.00
Colorado.....	111,307.77	New York.....	688,935.60
Connecticut.....	124,500.00	North Carolina.....	378,800.00
Delaware.....	34,700.00	North Dakota.....	42,500.00
District of Columbia.....	76,815.21	Ohio.....	308,099.50
Florida.....	177,100.00	Oklahoma.....	233,472.23
Georgia.....	329,900.00	Oregon.....	102,600.00
Hawaii.....	75,697.00	Pennsylvania.....	643,100.00
Idaho.....	93,600.00	Puerto Rico.....	279,700.00
Illinois.....	453,915.00	Rhode Island.....	56,997.00
Indiana.....	233,700.00	South Carolina.....	252,900.00
Iowa.....	233,040.00	South Dakota.....	81,000.00
Kansas.....	155,400.00	Tennessee.....	325,000.00
Kentucky.....	324,200.00	Texas.....	528,700.00
Louisiana.....	192,990.23	Utah.....	75,800.00
Maine.....	54,328.90	Vermont.....	55,000.00
Maryland.....	153,400.00	Virginia.....	268,500.00
Massachusetts.....	275,200.00	Washington.....	131,983.17
Michigan.....	315,900.00	West Virginia.....	181,104.50
Minnesota.....	205,915.00	Wisconsin.....	158,816.63
Mississippi.....	287,200.00	Wyoming.....	24,798.27
Missouri.....	272,845.84		
Montana.....	68,931.00	Total.....	10,722,115.21

The total amount of funds budgeted from all sources in the cooperative health program in the 48 States, the District of Columbia, Alaska, Hawaii, and Puerto Rico during the fiscal year 1941 was \$109,352,919.33. This is an increase of \$25,598,687.61, or 30.56 percent, over the fiscal year 1940 when, according to the latest revision, \$83,754,231.72 was the amount budgeted. This increase does not necessarily represent additional funds available for public health services, but rather the extension of cooperative health programs to more counties and cities with the result that these communities now submit their budgets to the Public Health Service.

The distribution of funds budgeted from all sources as well as from title VI alone according to the purposes for which the funds were budgeted by the States and Territories is shown in table 2.

TABLE 2.—*Funds budgeted from all sources for cooperative health work, by purpose, and proportion of contribution from title VI funds, for the fiscal year ended June 30, 1941*

Purpose	Amount budgeted from all sources	Percent of funds budgeted for each purpose		Ratio of title VI funds to amount budgeted from all sources
		All sources	Title VI	
Training.....	\$1,932,355.49	1.77	9.39	62.72
Administrative, clerical, and fiscal.....	2,688,916.67	2.46	4.91	23.58
Capital investment.....	30,123.82	.03	.06	23.65
State-wide health services:				
Preventable disease control:				
General.....	1,235,568.67	1.12	2.01	21.03
Tuberculosis.....	1,091,472.12	1.00	2.95	34.84
Venereal diseases.....	916,807.82	.84	.25	3.45
Pneumonia.....	523,225.04	.48	2.35	57.88
Cancer.....	382,910.64	.35	1.37	46.27
Malaria.....	323,748.00	.30	1.16	46.09
Rodent plague.....	197,031.63	.18	.69	45.15
Trachoma.....	92,143.50	.08	.24	33.43
Laboratory.....	5,395,720.54	4.93	5.52	13.20
Maternal and child health.....	3,692,751.88	3.38	.11	.40
Sanitary engineering.....	3,361,273.50	3.07	8.29	31.84
Aid to crippled children.....	2,656,906.37	2.43		
Vital statistics and other statistical research.....	2,042,169.92	1.87	3.81	24.05
Public health nursing.....	1,304,118.76	1.19	1.68	16.62
Supervision of local health services.....	1,222,313.37	1.12	4.66	49.21
Food and drugs, including narcotics.....	839,866.45	.77	.93	14.30
Public health education.....	815,086.13	.75	2.39	37.82
Dental hygiene.....	685,365.60	.63	.78	14.69
Industrial hygiene.....	584,075.74	.53	3.76	83.19
Medical care.....	432,499.21	.39	.49	14.70
Surveys and studies.....	139,156.24	.13	.38	35.09
Personnel administration.....	106,535.97	.10	.38	45.82
School medical inspection.....	105,614.00	.10	.07	8.05
Mental hygiene.....	83,522.54	.08	.16	24.38
Boards of examiners and registration.....	55,301.00	.05		
Embalming and undertaking.....	52,287.82	.05		
Public welfare.....	763,758.85	.70		
Institutional care.....	3,635,507.70	3.32		
Tuberculosis sanatoria.....	13,755,757.80	12.58	.16	.15
Local health services.....	58,209,026.54	53.22	41.05	9.10
Total.....	109,352,919.33	100.00	100.00	11.80

It should be noted that 41.05 percent of title VI funds is budgeted for local health services, which include all types of local health activity and, in many instances, projects dealing with special health problems such as industrial hygiene, venereal diseases, pneumonia, tuberculosis, and cancer. Activities carried out on a State-wide basis are administered at the State level but have local application.

The amount of title VI funds budgeted for sanitary engineering is 8.29 percent of the total and represents the greatest participation in any one activity with the exception of local health services. Sanitary engineering personnel are engaged in safeguarding water, milk, and shellfish supplies, and in various environmental sanitation activities throughout the States and in individual communities.

While title VI funds constitute only 11.80 percent of the total amount budgeted for health work, it will be noted from column 4 of table 2 that the proportion of title VI funds to total funds is greatest in those activities which have assumed special importance in recent years. For example, in the case of industrial hygiene, a field in which increased activity has been rendered imperative by the national emergency, 83.19 percent of the total amount budgeted is derived from title VI funds. Similarly, title VI funds constitute 62.72 percent of the total amount budgeted for the important task of training public health personnel; 57.88 percent of the amount devoted to pneumonia control; and 46.27 percent of the amount devoted to cancer control. Constructive activity in these and other fields in which the application of modern health-conserving techniques had lagged or been neglected is now vigorously being carried on as part of the cooperative public health program made possible by title VI of the Social Security Act.

THE STATUS OF PUBLIC HEALTH ACTIVITIES IN THE STATES

Working relationships with State and local health authorities were maintained during the year through six district offices of the Public Health Service with headquarters in New York City, Washington, D. C., Chicago, Ill., New Orleans, La., San Francisco, Calif., and San Juan, P. R. By means of these district offices it has been possible to maintain closer, more effective, and more personal contact between the Public Health Service and State and local authorities than would otherwise be possible. Each district office is under the direction of a medical officer who is assisted by a staff of junior medical officers, sanitary engineers, a public health nurse, a field auditor, and the necessary clerical personnel.

CONSULTATION SERVICES TO THE STATES

At the request of the States, the district offices furnished consultation services on problems pertaining to public health and the administration of title VI and Venereal Disease Control Act funds. State budgets were reviewed and audits were made of all Federal and State funds expended in connection with cooperative health programs. Noteworthy improvements were achieved in the methods of handling State budgets and in many phases of public health administration. In a number of States these improvements resulted in increased appropriations by State legislatures for public health work.

Besides giving advice and assistance to the States on general administrative and fiscal matters, the district offices provided consultation services in venereal disease control, public health nursing, and several aspects of sanitary engineering. In cooperation with the

Public Health Service liaison officers assigned to the Army, the district offices rendered valuable and timely service in helping to meet the crucial community health problems resulting from the defense program. Advisory and consultation services in more specialized fields of public health such as industrial hygiene, mental hygiene, dental hygiene, malaria control, cancer control, pneumonia control, plague control, public health education, and laboratory methods were furnished, sometimes with the assistance of the central office and other Divisions, especially the National Institute of Health. A medical officer assigned by the Division continued to direct the field consultant staff of the Committee on Records and Reports of the Conference of State and Provincial Health Authorities. At the request of the States, surveys of professional service records, methods of reporting, and general administrative practices were conducted in Colorado, Connecticut, Indiana, and Missouri. On January 1, 1941, this work was transferred to the Division of Public Health Methods of the National Institute of Health.

At the request of the appropriate health authorities, surveys of health problems and evaluation of the methods employed in meeting them were undertaken in a number of States and communities. These surveys resulted in improved methods, in the reorganization of a number of city and county health departments, and in the complete reorganization of one State health department.

LOCAL HEALTH SERVICES

If any single figure were to be taken as an index of the status of public health work throughout the Nation, the number of full-time health units organized at the local level would best serve such a purpose.

During the year, the number of such units has continued to increase. On June 30, 1941, 1,669 counties were served by health units under the direction of a full-time medical officer. These services were of three types: The single-county unit, the district unit which serves two or more counties or other local political subdivisions, and the State supervisory unit. The increase in the number of full-time units of all types during the year was 92, or 5.8 percent.

Single-county units increased from 655 to 663, an increase of 1.2 percent during the year and 36.4 percent since December 31, 1935. District units continued to show the greatest rate of increase. At the end of the fiscal year, 426 counties were served by 153 local district units, an increase during the year of 70, or 19.7 percent, in the number of counties served, and 31, or 25.4 percent, in the number of district health units. Five hundred and eighty counties were covered by 112 State supervisory units, an increase of 14, or 2.5 percent, in the number of counties covered, and 6, or 5.7 percent, in the number of supervisory units.

MERIT SYSTEM OF PERSONNEL ADMINISTRATION

The establishment of merit systems of personnel administration for employees of State and local health departments is rapidly becoming Nation-wide.

The importance of this development cannot be overemphasized. In public health work a very large share of the services rendered is technical, bringing the worker into close personal contact with the recipients of the services, and, therefore, it is of paramount importance that these services be rendered by competent, well-qualified personnel. Under a merit system, recipients of public health services have material assurance that they will be served by the best qualified individuals available.

The adoption of merit systems by State and local health departments is also important from another standpoint. As a result of the security of tenure and other advantages that characterize employment based on merit principles, public health as a profession tends to become more attractive. The present national emergency has rendered the problem of recruiting personnel particularly acute, but when the emergency is past the prevalence of merit status will assure a more nearly adequate supply of well-qualified professional public health workers intent upon career service.

It is, therefore, gratifying to note that rules and regulations governing personnel management on a merit basis have been established in all State health departments. Furthermore, a majority of these agencies have developed detailed personnel classification plans and have completed or will complete in the near future merit system examinations for the various positions. As merit systems are established at the State level, efforts are directed towards achieving the same status for local health department employees. It is expected that a large proportion of both State and local public health personnel will have merit system status by the end of the fiscal year 1942.

PERSONNEL TRAINING

As State and local health departments, stimulated and aided by the cooperative health program, expanded their facilities and undertook new programs, the need for technical training of personnel became evident. In order to meet this need the Public Health Service in 1936 sponsored a training program by means of which State and local public health personnel could receive postgraduate instruction in schools of public health as well as training and experience in training centers and field stations. This training program has been continued without interruption since its inception.

During the fiscal year, 1,175 applications for training were received from State and Territorial health departments and were approved by the district offices of the Public Health Service. These applications proposed 1,320 training periods varying from 1 month or less to a full academic year plus field training. A majority of the applicants proposed periods of academic study or university-accredited field training. More than one-half of the physician-applicants, however, desired nonaccredited field practice, which includes supervised experience in health department training centers, hospitals, and clinics, and especially experience in institutions for the diagnosis and treatment of venereal diseases. Detailed information concerning types of training proposed by the several professional classes of trainees is shown in table 3.

TABLE 3.—*Distribution of trainee applications by professional class of trainees and by type of training proposed during the fiscal year 1941*

Types of training proposed	Professional class									
	All classes		Medical		Nursing		Sanitation		Other	
	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent
All types.....	1,320	100.0	347	100.0	664	100.0	232	100.0	77	100.0
Academic study.....	858	65.0	166	47.8	469	70.6	154	66.4	69	89.6
Accredited field training.....	112	8.5	4	1.2	91	13.7	16	6.9	1	1.3
Nonaccredited field practice.....	350	26.5	177	51.0	104	15.7	62	26.7	7	9.1

Training financed by title VI funds was proposed by 82.6 percent of all applicants. In contrast to this general distribution, almost one-half of the physician-applicants proposed training financed by funds allotted under the Venereal Disease Control Act. The distribution of trainee applications by professional class of trainees and by source of funds is shown in table 4.

TABLE 4.—*Distribution of trainee applications by professional class of trainees and by source of funds for the fiscal year 1941*

Sources of funds	Professional class									
	All classes		Medical		Nursing		Sanitation		Other	
	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent
All Federal sources.....	1,175	100.0	332	100.0	565	100.0	200	100.0	78	100.0
Title VI ¹	971	82.6	183	55.1	518	91.7	199	99.5	71	91.0
Venereal disease ²	193	16.4	146	44.0	40	7.1	—	—	7	9.0
Title VI and venereal disease.....	5	.5	3	.9	1	.1	1	.5	—	—
Title VI and Children's Bureau ³	6	.5	—	—	6	1.1	—	—	—	—

¹ Title VI of the Social Security Act.

² Federal Venereal Disease Control Act.

³ Funds available through Children's Bureau, U. S. Department of Labor, under Social Security Act.

The value of this technical training program has been amply demonstrated by the fact that it has helped to provide personnel to meet the demands of augmented emergency health activities. When the program was inaugurated, fewer applications were anticipated with each succeeding year, but now it is evident that the need for federally sponsored training is greater than ever. This need is due partly to the national emergency and partly to the increasing amount and types of services being performed by State and local health departments.

PUBLIC HEALTH NURSING

Although the need for public health nursing service increased considerably during the year, the total number of public health nurses employed on January 1, 1941, was slightly less than on January 1, 1940. The annual census of public health nursing showed that on

January 1, 1941, 23,533 public health nurses were on duty, which was 172, or 0.7 percent, less than the number employed on January 1, 1940. Detailed data from this census covering the last 5 years are shown in table 5.

TABLE 5.—*Total number of public health nurses employed in the United States and in the Territories of Hawaii and Alaska on Jan. 1 of the years 1937, 1938, 1939, 1940, and 1941*

	Number of public health nurses employed in—				
	1937	1938	1939	1940	1941
Grand total.....	19, 939	21, 886	23, 029	23, 705	23, 533
State agencies ¹	791	827	814	840	939
Local health departments:					
Rural.....	3, 121	3, 491	3, 918	4, 399	4, 377
Urban.....	4, 451	5, 211	5, 262	5, 301	5, 179
Local boards of education.....	3, 477	3, 887	4, 120	3, 952	4, 010
Local nonofficial agencies.....	5, 791	5, 963	5, 947	5, 820	5, 803
Industrial companies.....	2, 203	2, 384	2, 841	3, 271	3, 092
National agencies and universities.....	105	123	127	122	133
Number of cities having no public health nursing of any type.....		26	14	20	31
Number of counties having no rural public health nursing service.....		1, 057	780	857	679

¹ Includes District of Columbia.

Of the 23,533 public health nurses on duty January 1, 1941, approximately 45 percent were employed by official health agencies, 17 percent by boards of education, 25 percent by nonofficial local agencies, 13 percent by industrial companies, and less than 1 percent by nonofficial national agencies.

The decrease in the number of nurses appears to be distributed among the various types of agencies. This was the first year since Social Security Act funds became available in which there was not a considerable increase in the number of nurses employed by rural health departments. While several States reported a significant increase in the number of industrial nurses employed, the decrease in the total number of such nurses on duty is accounted for by the fact that New York listed only those nurses who responded to the questionnaire; in previous years New York had made allowance for nurses who did not respond.

Encouraging progress was made during the year in improving the educational qualifications of public health nurses. In 1940, 3,907 nurses, or 22.4 percent of the 17,470 about whom information was received, had completed one or more years of university training in public health nursing. In 1941, 5,097 nurses, or 23.9 percent of the 19,664 about whom information was obtained, had completed one or more years of approved academic training. Several States which previously had very low percentages of fully qualified nurses achieved remarkable progress during the year. Five States doubled the proportion of fully qualified nurses. A few States showed slight decreases. The percentage of nurses with no formal training in public health was reduced from 39.7 in 1940 to 35.6 in 1941.

The type of public health nursing assistance given to the States is changing as the States develop better-qualified staffs of nursing con-

sultants. During the first years of the Social Security program, Public Health Service nursing consultants devoted a considerable portion of their time to conducting institutes of various types in cooperation with State nursing consultants. These functions are now being performed by the State nursing consultants, and Public Health Service consultants are assisting in the development of merit-system plans, venereal disease and industrial nursing programs, and the development of adequate nursing facilities in defense areas.

PUBLIC HEALTH SANITATION ACTIVITIES

Effective July 1, 1940, the interstate sanitary districts were abolished as separate units and became integrated with the six public health districts under the control of the respective district directors. Under the new organizational plan, engineering staffs continued to render consultation services to State and local health departments on all phases of sanitation and public health engineering. Surveys were made of State public health engineering programs utilizing funds made available by title VI of the Social Security Act, and in many instances recommendations were made relative to the expansion of such programs or their closer integration with the State health department program as a whole.

SANITARY REGULATION OF COMMON CARRIERS

One of the major activities of the district engineering staffs in cooperation with the Sanitation Section of the Division of Domestic Quarantine and the State health departments is the enforcement of regulations providing for the safety of drinking and culinary water, milk and food supplies, and general sanitary facilities of common carriers operating in interstate traffic.

Early in the fiscal year, the Surgeon General appointed an advisory committee of 14 members to consider revision of the present standards governing drinking and culinary water supplies of interstate carriers. These standards have been in effect since 1925. A tentative revision was drafted by a subcommittee of six Public Health Service officers and at the end of the fiscal year was submitted to the advisory committee for review.

Vessel sanitation.—Responsibility for checking the precautions used in handling originally safe water at shore taps and hydrants is gradually being assumed by State health department personnel. Supervision of methods of storage, treatment, and distribution on shipboard, however, is a direct responsibility of the Public Health Service and continues to be handled by the district engineering staffs. Storage tanks, pipe systems, and treatment processes were inspected, and numerous plans for water systems on vessels under construction were reviewed and certified. Many of these plans were for vessels being built under the auspices of the United States Maritime Commission for foreign rather than interstate service.

In August 1940, outbreaks of several cases of typhoid fever occurred on each of two British vessels, both of which had taken on water at Baltimore and Norfolk. A thorough investigation was undertaken in both places by the district office, but no conditions impugning the

water supply were found in either city. The possibility of sabotage was later investigated by the Federal Bureau of Investigation.

In recognition of the necessity of providing shipbuilders and vessel operators, as well as State and local health officers, with a comprehensive guide to sanitary requirements on vessels, a sanitation code for vessels was prepared. At the end of the fiscal year this code was being reviewed, and it was expected to be available for distribution, at least in tentative form, early in the new fiscal year.

At the request of the Committee on Boat Pollution of the Great Lakes Board of Public Health Engineers, the district office at Chicago assisted in a survey and compilation of data on the discharge of sewage, ballast water, garbage, and refuse from Great Lakes vessels, particularly in the vicinity of domestic water supply intakes.

Railway, motorbus, and air carrier sanitation.—From 1921 through 1938, the Public Health Service district engineering personnel inspected watering points at the larger railroad centers, terminals, and coach yards, but because there were not enough engineers little supervision was possible at smaller watering points. It was recognized that much wider coverage could be obtained if State health department personnel were trained to do this work, and consequently the district offices of the Public Health Service undertook to provide such training. As a result, State and local personnel are now doing most of this work. During the fiscal year, 85 percent of the 2,352 watering points used by interstate land and air carriers were inspected and reports on them were submitted to the Public Health Service.

During the year, 96 percent of the 1,859 sources of water supply used by such carriers were investigated by State health departments; 1,298, or 75 percent, were certified favorably; 342, or 18 percent, were certified provisionally; and 52, or 3 percent, were prohibited from use. Only 67, or less than 4 percent, were not reported.

Nearly all of the submerged or below-ground-level hydrants now used for railway-coach watering are potentially hazardous. Therefore, the district office in Chicago has encouraged railway companies to experiment with the installation of overhead water lines equipped with cranes and flexible hose connections. A number of plans for such improved watering systems have been submitted.

During the year, a minimum code of sanitary requirements for interstate land and air carriers was developed to supersede the too general requirements of the United States Interstate Quarantine Regulations. At the end of the fiscal year the new code was being reviewed, and it was expected to be available in tentative form early in the next fiscal year.

Supervision of milk and milk products served on interstate carriers was intensified during the year. A number of unsatisfactory sources of supply were proscribed and others were given a reasonable time to meet requirements. Surveillance was maintained of shellfish served in dining cars, and an experimental rating survey on this aspect of carrier sanitation was conducted. A special study was made of the efficiency of several types of water filters used in railway dining cars.

Reciprocity with Canada.—In furtherance of the "good neighbor" policy, as well as in the interest of mutual public safety, the United States Public Health Service and the Department of Pensions and National Health of the Dominion of Canada have continued the close

and cordial cooperation of past years. During the year, the Public Health Service was kept informed concerning the safety of 35 Canadian water supplies used by common carriers in the United States, and reports and recommendations were submitted to Canadian authorities on 71 water supplies in the United States used by Canadian carriers. Information of mutual interest to the two Governments on shellfish and environmental sanitation was also exchanged.

MILK AND FOOD SANITATION

Field consultation services on milk and food sanitation were furnished to most States by the district milk specialists. State-wide milk sanitation surveys were conducted in several States, and assistance was given in the organization of State and local milk sanitation programs and the training of personnel.

The standard milk ordinance recommended by the Public Health Service for voluntary adoption by local communities was in effect at the end of the fiscal year in 109 counties and 851 cities located in 34 States. This represents an increase of 22 counties and 86 cities during the year. During the year, one State adopted the milk ordinance as part of the State health department regulations applicable throughout the State. Many communities in which milk sanitation was governed by earlier editions of the recommended ordinance revised their local ordinances to conform with the latest (1939) edition. Twice during the year the Public Health Service published lists of communities awarded ratings of 90 percent or more for compliance with the standard ordinance.

Although the restaurant sanitation ordinance recommended by the Public Health Service for voluntary local adoption was first issued in definitive form in June 1940, incomplete reports indicate that it is already in effect in many communities and defense areas in at least 17 States, including 5 in which it has State-wide application.

The compilation of outbreaks of disease during 1939, assembled from reports submitted by State health departments, was extended to include not only milk-borne outbreaks, but also those traced to water and food products in general. The compilation showed 43 of the 249 outbreaks to have been traced to water supplies, 41 to milk and milk products, 148 to other foods, and 17 to unidentified vehicles of transmission.

The Public Health Service continued to cooperate with States in the investigation of the efficacy of sanitation practices related to the production and handling of shellfish. Growing areas and shucking and packing plants were subjected to bacteriological examination, and endorsement was given to 1,878 certificates issued by State health departments. Lists of dealers certified by the States were prepared by the Public Health Service at semimonthly intervals and sent to health officials of the United States and Canada. A joint survey was made in Vera Cruz, Mexico, by the Texas State Department of Health, the Public Health Service, and the Pan American Sanitary Bureau, at the request of Mexican officials and a dealer who wished to ship oysters into the United States.

The research study conducted at Craney Island, Va., in collaboration with the Virginia State Department of Health, for the purpose of determining the significance of bacteriological examination of

shucked oysters, was continued. Assistance was given to officials of several States in connection with the increased restrictions concerning wet storage of oysters.

The shellfish sanitation code, partially completed during the previous fiscal year, was further developed. After undergoing review, it will be used experimentally in several of the districts for at least one shellfish season prior to final adoption.

WATER SUPPLY AND SEWAGE DISPOSAL

Consultation services to States and localities on problems related to water supply and sewage disposal continued to be a major activity of the district engineering staffs. Much assistance was given to municipalities in providing sanitary facilities in connection with housing programs. Many Federal agencies were aided in establishing and maintaining sanitary facilities in institutions and areas under their control. Emergency chlorination equipment and technical aid were made available in Louisiana at the time of the flood disaster in the western part of the State. Special attention was devoted to providing the Army and State and local health authorities with prompt and active help in meeting the many and urgent sanitation problems resulting from the defense program.

A survey of water supply facilities was undertaken in Puerto Rico, where the problem of providing adequate and safe drinking water is particularly acute. At the request of the State Department, an engineer was assigned to conduct a survey of existing water systems at Guayaquil and Quito, Ecuador, in order to appraise the technical soundness and estimated cost of proposed improvements to be financed by a loan from the Export-Import Bank of the Federal Loan Agency.

A ground-water code was drafted and submitted to State health departments for review. It has undergone revision on the basis of the comments received and will be resubmitted to the States for additional comment before it is adopted.

At the request of numerous Federal agencies as well as many State and local health authorities, the Public Health Service sponsored the formation of a Joint Committee on Rural Sanitation which has as its first objective the formulation of recommendations concerning minimum requirements for sewage disposal facilities in areas now unsewered. It is hoped subsequently to extend the scope of the committee to include water supplies and possibly other phases of environmental sanitation in rural areas.

STREAM SANITATION

The Office of Stream Sanitation, located in Cincinnati, Ohio, furnished consultation service and cooperative assistance to State health departments and other official agencies on matters pertaining to the abatement of stream pollution.

Ohio River pollution survey.—The major activity of the Office of Stream Sanitation during the year was the continuation, in collaboration with the Army Corps of Engineers, of the pollution survey of the Ohio River system ordered by the Rivers and Harbors Act of 1937.

Laboratory analyses of 71,125 water samples were performed by the central laboratory in Cincinnati, the laboratory maintained on a boat in the upper Ohio River, and six mobile laboratory trailer

units operating at various points throughout the watershed. Special investigations were made of the potential dangers from water-borne diseases, the effects of domestic and industrial wastes and acid mine drainage upon streams, and taste and odor factors in river water supplies.

All routine field and laboratory investigations of the survey were completed, and most of the survey personnel and equipment were transferred to emergency defense activities. The limited personnel remaining were engaged in summarizing data and determining the extent and costs of needed pollution abatement facilities. It was expected that the complete report would be available before the end of the calendar year 1941.

It has been suggested that pollution during periods of low flow might be abated by releasing water which is to be stored in proposed flood control reservoirs in the Ohio River watershed. A supplementary investigation was conducted in collaboration with the Army Corps of Engineers to determine the advisability of this method and the monetary value of the water which would be required.

Sealing of abandoned coal mines.—An important cause of stream pollution in some areas is drainage from abandoned or unworked coal mines in which the ground water becomes contaminated with sulfuric acid. The production of acid from the coal refuse in such mines can be stopped by shutting off the supply of oxygen, and for several years the Public Health Service has assisted State health departments and the Work Projects Administration in carrying on mine-sealing projects. Since December 1933, approximately \$8,000,000 have been devoted to this purpose in Alabama, Illinois, Indiana, Kentucky, Maryland, Ohio, Pennsylvania, Tennessee, and West Virginia.

During the first half of the fiscal year, projects were in operation in Alabama, Maryland, Ohio, and West Virginia, with a maximum of 800 men employed. In November 1940, lack of funds made it necessary for the Public Health Service to withdraw most of the technical supervision it had been providing. As a result, the Alabama project was discontinued at once, and the Maryland and Ohio projects a few months later. At the end of the fiscal year, actual construction work was limited to West Virginia, with 275 men employed.

Notable results have been achieved with these projects wherever continuity of operation has been maintained, but without proper follow-up work the initial construction rapidly becomes ineffective. The nature of the sealing process makes close observation and control imperative for a 3- to 5-year stabilization period, with intermittent maintenance thereafter. In Alabama, Indiana, Kentucky, Maryland, Ohio, Pennsylvania, and Tennessee, where such follow-up work has not been provided, the construction cannot be currently valued at more than 30 percent effective.

Other surveys and activities.—Other activities in the field of stream sanitation included the preparation of a report on the survey of the Grand (Neosho) River; assistance to the health authorities of Minnesota and the Province of Ontario, Canada, in preparing the final report of the Rainy River survey; similar assistance to the

North Dakota State Department of Health in connection with the survey of the Red River of the North; cooperation with the Maine State Bureau of Health in a survey of the Androscoggin River; preparation of a tentative plan, with estimated costs, for a study of oil refinery wastes and their effect on streams, to be made in collaboration with the Bureau of Mines of the Department of the Interior; coordination of various reports of the Army Corps of Engineers and other agencies into a final report on the sanitary condition of the North Canadian River watershed; and advisory assistance to the State health authorities of Oregon and Washington in connection with the progress of the Columbia River survey, together with suggestions for future studies.

COMMUNITY SANITATION

The Public Health Service continued to furnish technical assistance and supervision to the community sanitation projects operated by the Work Projects Administration. A total of 273,622 sanitary privies were constructed and installed in 919 counties of 37 States. An average of 12,051 relief workers were employed monthly. Since the program was begun on July 1, 1935, approximately 2,270,000 sanitary privies have been provided, including 16,931 constructed, but not reported, during the previous fiscal year in Puerto Rico.

Because of further decrease in the amount of funds allotted to the Public Health Service for this purpose during the fiscal year, State departments of health found it necessary to assume greater responsibility in promoting the work and rendering technical assistance. Lack of relief labor and certain restrictions governing the operation of the projects resulted in a curtailment of activity in some States. It is believed, however, that the accomplishments of these projects as a whole justify their continuance.

PUBLIC HEALTH ENGINEERING ABSTRACTS

The Sanitation Section of the Division of Domestic Quarantine, with the aid of the district engineering staffs, continued to issue the Public Health Engineering Abstracts, a monthly publication containing abstracts of technical articles published in current domestic and foreign engineering journals. Distribution is free to libraries and those engaged in public health engineering. Circulation at the end of the fiscal year was 1,625, including recipients in 25 foreign countries.

Volume 20, for the calendar year 1940, contains abstracts as follows: Air conditioning, 19; garbage and refuse disposal, 50; housing, 20; industrial hygiene, 92; malaria and other insect-borne diseases, 121; milk and other foods, 170; plague and rodent control, 9; public health administration, 58; recreational sanitation, 7; rural sanitation, 20; sewage, sewerage, and industrial wastes, 235; swimming pools and bathing places, 29; and water supply, 308.

MALARIA CONTROL

Technical assistance and supervision of malaria control drainage projects of the Work Projects Administration were provided as in

previous years. A shortage of relief labor and administrative restrictions applied to these projects resulted in a curtailment of activities in several States. During the fiscal year, approximately 720 miles of drainage ditches were constructed in about 100 counties of 15 States, effecting drainage of about 7,500 acres of land. A monthly average of 5,500 relief workers were employed. Since the beginning of the Work Projects Administration program in 1935, about 15,600 miles of ditches have been constructed, draining an area of approximately 286,300 acres of land which had served as breeding grounds for anopheline mosquitoes.

The total amount budgeted from all sources during the year by State health departments specifically for malaria control was \$323,748.00, an increase of 13.3 percent over the previous year. Of the amount so budgeted, 45.15 percent was provided by title VI.

During the last 5 years, 26 dams, all except 1 of which are of the low-head type used for purposes of navigation, have been constructed across the Mississippi River between Alton, Ill., and St. Paul, Minn. As a result, much land has been inundated, and *Anopheles quadrimaculatus*, the malaria-bearing mosquito, has become prevalent. In order to study the situation and institute proper control measures, the Public Health Service, in cooperation with the State health departments of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, is participating in a survey of the affected areas. It is expected that recommendations for control work will be presented to the agencies concerned by the end of the calendar year 1941.

During the latter part of the fiscal year, many State health departments were assisted in surveying potential malaria hazards and instituting control measures in the vicinity of military camps and industrial defense areas.

TYPHUS CONTROL

In cooperation with the Georgia State Department of Public Health, a study was undertaken in Savannah to determine the effectiveness of ratproofing buildings as a method of rodent control. In conjunction with this study, which has not yet been completed, work in typhus epidemiology was continued at the typhus control laboratory at Savannah.

The Virginia State Department of Health was assisted in a program of garbage disposal and rodent control undertaken as a result of the existence of endemic typhus at Richmond.

PLAGUE CONTROL

During the past 5 years, plague infection in wild rodents has steadily progressed from the Pacific coast eastward as far as North Dakota. Developments during the year indicate that the problem is becoming increasingly serious. In the past, outbreaks of human plague have almost invariably been preceded by a marked increase in the disease among animals which harbor the infection. Such an increase is now in evidence. Unless more adequate control measures are undertaken, the infection may be expected to spread to the more populous areas of the Middle West and the East, and serious outbreaks of human plague may occur.

Plague in the Western States.—Surveys conducted by the Public Health Service in 1935 revealed plague infection among wild rodents in California, Montana, and Oregon. In each succeeding year, including 1941, infection has been demonstrated in ground squirrels, chipmunks, wood rats, marmots, and other wild rodents in Arizona, California, Idaho, Montana, Nevada, New Mexico, Utah, Washington, and Wyoming. Nevertheless, except in California and very recently in Idaho, Montana, Oregon, and Washington, where the States have supplemented Public Health Service activities, epidemiological investigation has been restricted almost entirely to the work done by the four mobile survey and laboratory units maintained by the Public Health Service. The reason for this failure of many States to institute control measures is believed to be the infrequency of the occurrence of plague infection in human beings. During the year, two human cases, one of which was fatal, were reported. Both were apparently acquired from species of squirrels in which infection had not previously been demonstrated.

Plague infection was also discovered during the year in rats in the cities of San Francisco, Oakland, and Richmond, Calif. The infected rat trapped in San Francisco was the first to be found there since 1908, although thousands of rats have been examined each year for evidence of plague. During the year, infection was widespread throughout the State from Los Angeles County in the south to Siskiyou County in the extreme north.

During the year, three additional survey trucks and operating personnel were provided in California, bringing the total number of mobile units in that State to seven. During the spring and early summer of the fiscal year, Washington furnished two such units, and Idaho, Montana, and Oregon each furnished one. Operation of these units was financed by title VI funds, and the materials obtained by the survey parties were sent to the Public Health Service laboratory in San Francisco for examination. Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming took no action with regard to the infection within their boundaries, and such work as was carried on in these States was done by the mobile units operated by the Public Health Service.

Efforts are being continued to bring home to State health authorities a realization of the potential danger to human life involved in rodent plague, and to encourage them to undertake plague surveys and adequate suppression programs. The total amount budgeted from all sources during the year by State health departments for control of rodent plague was \$197,031.63, an increase of 26.0 percent over the previous year. Of the amount so budgeted, 33.43 percent was provided by title VI.

Public Health Service laboratory in San Francisco.—All bacteriological and animal tests of rodents, tissues, and ectoparasites collected by the survey units of the Public Health Service and the States of Idaho, Montana, Oregon, and Washington, as well as of the rats and their ectoparasites collected in the San Francisco Bay regions, were performed by the Public Health Service laboratory in San Francisco. Of the 59,278 animals collected during the year, 31,610 were examined by dissection. Animal inoculation tests

were performed with 2,406 specimens of rodent tissues and parasites, of which 40 were found to be infected with plague.

The identification and cataloging of fleas was continued, and the collection now contains all of the families and subfamilies of North American fleas. Experimental studies in plague epidemiology were carried on, including the investigation of bacterial strains and antigens for use in the detection of plague.

Plague in the Territory of Hawaii.—The plague-eradication campaign carried on in the Territory of Hawaii in collaboration with the Territorial health department was continued. Activities consisted of ratproofing; control of materials attracting rats; rodent eradication by poisoning, trapping, shooting, clubbing, and gassing with cyanide; and laboratory examination of rodents and their ectoparasites.

During the year, no human plague was reported on either the island of Maui or the island of Hawaii. On Maui, 2 plague-infected rats were found, the first to be discovered since December 1937, although 58,883 rats were examined in the interim. On Hawaii, 80 cases of rodent plague were discovered during the year, 33 more than during the previous year, but 49 less than during the year ended June 30, 1939.

The effectiveness of the eradication measures employed on the island of Maui were indicated by the fact that the rat index based on the number of rats caught per day per 100 traps fell to 2.25, the lowest on record. The reduction is believed due chiefly to an expanded and improved poisoning program, with the use of a thallium sulfate-treated barley bait which has proved particularly effective. On the island of Hawaii, the rat index for the year was 4.75, as compared with 3.39 for the previous year. Reports based on damage to the sugarcane crop also indicated an increase in the rat population. To combat this increase, an intensified poisoning program was undertaken, and by June the rat index had been reduced to 3.75.

PNEUMONIA CONTROL

With the introduction of new and highly effective chemotherapeutic drugs, treatment of the pneumonias has undergone a notable advance in the last few years. Pneumonia control programs in a number of States have been adapted to the new therapeutic developments, but lack of funds for personnel, equipment, and materials continues to make actual progress fall short of potential achievements. In a number of States free typing, serum, and drugs are available only after certification of the patient by welfare authorities. In some States typing is required before drugs can be administered. Moreover, hospital and nursing facilities, both extremely important in the care of pneumonia patients, are inadequate. These restrictions and limitations result in pneumonia remaining one of the most important preventable causes of death.

During the year, two additional States undertook pneumonia control programs, but existing programs were curtailed in several States. The amount budgeted from all sources for pneumonia control was \$523,225.04, or 20.6 percent less than during the previous year. This reduction can be accounted for to some extent by the use of sulfona-

mide drugs rather than the more costly serum treatment, but it is also partially explained by the diversion of funds to activities considered more urgent from the standpoint of national defense.

Fifty-seven and nine-tenths percent of the total funds budgeted for pneumonia control was provided by title VI of the Social Security Act.

TUBERCULOSIS CONTROL

Tuberculosis control programs covering various types of services are in effect in all of the States and Territories and the District of Columbia. The total amount budgeted for such programs during the year was \$25,962,200. Of this amount, 38.8 percent was budgeted by State health departments for their own programs and aid to local health departments, 6.7 percent by State welfare departments, 25.0 percent by State tuberculosis boards or commissions, and 27.2 percent by boards of eleemosynary institutions. Of the \$25,962,200, 3.9 percent was devoted to administrative and field services, 65.9 percent to the maintenance and operation of State hospitals, and 30.2 to State aid to local hospitals. Activities consisted of promulgating and enforcing State quarantine regulations, providing supervisory and consultation services to local programs, promoting educational work among physicians and the public, testing of school groups and demonstration programs among special groups in selected areas, the operation of hospitals and clinics, and nursing and laboratory services.

The total amount from all sources budgeted by State health departments during the year for promoting and coordinating tuberculosis control programs, including the extension of case-finding and clinic treatment, was \$1,091,472.12, an increase of 8.4 percent over the previous year. Of the amount so budgeted, 34.84 percent was provided by title VI.

The total amount from all sources reported by State health departments as budgeted for the maintenance and operation of tuberculosis sanatoria was \$13,755,757.80, an increase of 168.3 percent over the previous year. This large increase was due chiefly to more complete reporting than in previous years.

CANCER CONTROL

Cancer control programs were continued throughout the year in 27 States, and 6 additional States inaugurated programs. In many States activities consisted of educational work among laymen and physicians. In 9 States medical care for needy cancer patients was provided at State expense in private hospitals or State cancer hospitals.

The amount budgeted by the States during the year for cancer control, exclusive of expenditures by State cancer control commissions and State cancer hospitals, was \$382,910.64, of which 46.3 percent was provided by title VI. The total amount devoted to cancer work, including the budgets of State commissions and hospitals, was \$1,195,539.56.

DENTAL HYGIENE

At the end of the fiscal year, 41 States were conducting dental hygiene programs, an increase of 3 States over the end of the previous fiscal year. Activities consisted of educational work among dentists and the public, experimental studies, and demonstration programs which provided dental care to persons who otherwise would not have received it. The total amount from all sources budgeted by the States for dental hygiene purposes was \$685,365.60, or 30.8 percent more than during the previous year. Title VI funds constituted 14.69 percent of the total amount budgeted.

While there was thus a considerable increase in the amount of funds devoted to dental hygiene, the money thus budgeted by the 41 States represented only 0.78 percent of title VI funds available to these States. This is an even smaller ratio than that for the previous fiscal year when the amount budgeted by 38 States for dental programs was 0.90 percent of the title VI funds available to those States. In view of the high proportion of men rejected for military service because of dental defects, it is apparent that not enough emphasis is being placed on public health dentistry by the States.

During the year, assistance was given to the District of Columbia Council of Social Agencies in the organization of a broad dental hygiene program. Two motion pictures dealing with technical aspects of dentistry for children were produced, and assistance was given to the American Dental Association and other agencies in the preparation and revision of educational material. A dental officer of the Public Health Service continued to conduct short postgraduate courses in children's dentistry. Approximately 1,000 dentists in 6 States attended these courses during the year.

INDUSTRIAL HYGIENE

At the end of the fiscal year, 28 State health departments, 2 State labor departments, 2 Territorial health departments, and 4 city health departments had industrial hygiene divisions employing an aggregate of approximately 175 professional and 75 clerical workers. The total amount from all sources budgeted during the year for industrial hygiene activities of health department units was \$635,405.74, of which 79.53 percent was provided by title VI. Including the budgets of the two labor-department units, the total amount devoted to industrial hygiene activity was approximately \$800,000.

Progress was made during the year in a number of States in the control of many industrial hazards. Additional services were made available to the working population through the integration of industrial hygiene programs with other basic public health services. The outstanding needs in industrial hygiene are still additional funds and more trained personnel for the State and local units. The major role assigned to industrial productivity in the national defense effort has resulted in certain initial steps being taken to meet these needs. These steps are described in the section of this report dealing with the emergency health and sanitation activities of the Division.

MENTAL HYGIENE

There is increasing public realization of the fact that mental and emotional illnesses constitute a public health problem. The Public Health Service has tried to promote the acceptance of this concept and to encourage health authorities to take action in accordance with it.

At the beginning of the year, three States and one Territory had some type of mental hygiene program. During the year, three additional States inaugurated programs, and five others were committed to training personnel who, after a year's study, will organize and direct programs in their respective States.

While there was thus an increase in the number of States participating in mental hygiene activities, the amount budgeted from all sources for mental hygiene programs at the State level was \$83,522.54, or 28.5 percent less than the previous year. This decrease was due to substantial reductions in the amounts budgeted by Kentucky and Louisiana. Title VI funds provided 24.38 percent of the total amount budgeted for mental hygiene during the year.

In order to meet the need for psychiatrists with adequate training in the special fields of preventive and child psychology, as well as in the public health aspects of psychiatry, a 1-year training course in mental hygiene and public health was arranged at a leading university.

EMERGENCY HEALTH AND SANITATION ACTIVITIES

The national defense program gave rise during the year to many crucial public health problems. Large concentrations of troops in cantonment areas and industrial workers in areas containing defense industries imposed a tremendous strain upon State and local health and sanitary facilities, some of which could not be considered adequate even for the demands of normal times. In many areas, defense activities created altogether new problems with which local authorities were not prepared to cope.

On March 1, 1941, Congress authorized an urgent deficiency appropriation which made \$525,000 available to the Public Health Service during the rest of the fiscal year for use in assisting State and local health authorities in necessary activities, or in furnishing the needed services directly when the States or communities were unable to do so. Of the \$525,000 authorized, \$98,000 was allocated to the Industrial Hygiene Section of the National Institute of Health; the remaining \$427,000 was made available to the Division of Domestic Quarantine.

LIAISON AND RECONNAISSANCE ACTIVITIES

A Public Health Service officer was detailed to each of the nine Army corps areas to serve as liaison officer between the Service and the Army, Navy, and civilian health authorities on all health and sanitation matters pertaining to defense. In cooperation with military and civilian authorities and the district office staffs of the Public Health Service, these officers conducted comprehensive surveys of existing health, housing, and sanitation facilities in approximately

200 military and industrial defense areas, and prepared estimates of amounts, types, and costs of the various additional facilities needed to safeguard the health of both military and civilian populations. Additional surveys were conducted in a number of areas prior to military maneuvers in order to provide the Army with complete information regarding health and sanitation facilities and conditions in the maneuver areas. Military and civilian authorities were furnished consultation services on the control of malaria and other communicable diseases; pest mosquito control; water, milk, and food supply; sewage and garbage disposal; stream pollution; and venereal disease control. Assistance was given to State and local agencies in preparing proposals for federally financed projects suitable for certification as defense undertakings. The Public Works Administration was aided in preliminary investigations of the types of health and sanitary installations needed in defense areas. Cooperative relations were established with the Regional Coordinators of Health, Welfare, Recreation, and Related Defense Activities.

PROVISION OF EMERGENCY PERSONNEL IN DEFENSE AREAS

Certain areas selected for military cantonments or defense industries were without local health departments and essential sanitary facilities. If State or local agencies could not practicably and promptly furnish the necessary services, the Public Health Service assigned officers to organize emergency local health units which would at least be able to cope with the most pressing problems. By the end of the fiscal year, eight officers had been detailed for such duty and were operating emergency units with the aid of additional personnel supplied by the Public Health Service and the State health departments.

In order to supply trained personnel to augment inadequate staffs of health departments in defense areas, the Public Health Service undertook to recruit qualified physicians and other professional health workers for assignment to critical areas. All persons so recruited were given a 6-week course of intensive training for the purpose of orientation in the policies and procedures of the Public Health Service, as well as in the specific health problems encountered in defense areas. Requests for personnel submitted by State health officers were reviewed, and as personnel from the training courses became available they were assigned to the State health departments whose needs were considered most urgent. By the end of the fiscal year, 3 training courses had been completed, covering an enrollment of 134 professional health workers, including physicians, engineers, nurses, and laboratory personnel. On June 30, 1941, a total of 104 workers made available by this recruiting and training program were on active field duty in defense areas.

SURVEY OF NURSES AVAILABLE FOR DEFENSE WORK

At the request of the Nursing Council on National Defense, the Public Health Service assumed responsibility for directing the national survey of registered nurses. The purpose of this survey was to collect complete and accurate information on the number of reg-

istered nurses available for various types of military and civilian defense duty.

Approximately 460,000 questionnaires were sent to active and inactive registered nurses in all of the States and Territories. By June 15, 75 percent of the questionnaires had been returned. At the end of the fiscal year, the completed questionnaires were being coded, punched, and tabulated by Work Projects Administration workers under the supervision of the Public Health Service.

INDUSTRIAL HYGIENE DEFENSE ACTIVITIES

In view of the paramount importance of industrial production to modern military efficiency, it is evident that the success of the defense effort depends to a considerable degree upon how well we maintain and improve the health of industrial workers.

It has been estimated that 350,000,000 working days are lost each year through sickness and disability among industrial employees. The defense program has not only intensified the industrial hazards which are an important factor in contributing to sickness and disability, but it has created new hazards as a result of the use of new processes and materials. The accelerated pace of production has greatly increased the danger from fatigue and accidents on the job.

Early in January 1941, the Subcommittee on Industrial Health and Medicine of the Health and Medical Committee, Office of the Coordinator of Health, Welfare, Recreation, and Related Defense Activities, designated the Division of Industrial Hygiene of the National Institute of Health as the coordinating agency for all national defense industrial hygiene activities. The States' relations activities of the Division of Domestic Quarantine relating to industrial hygiene were therefore closely coordinated with the work of the Division of Industrial Hygiene.

Defense industrial hygiene activities carried on jointly by the two Divisions included: (1) Training of industrial hygiene personnel; (2) services to Government industrial establishments such as arsenals and Navy yards; (3) field and laboratory investigations; (4) assistance to State industrial hygiene units in (a) investigation and control of hazards; (b) plant construction and renovation in the interest of health and safety; (c) promotion of health examinations and medical care programs; (d) education; and (e) promotion of adult hygiene programs.

Personnel were recruited, trained, and assigned to aid seven State health departments in carrying on industrial hygiene activities vital to the defense program. Additional personnel were to be assigned to five more States at the beginning of the fiscal year 1942.

During March, April, and May 1941, consultation services were furnished to 16 States in regard to 527 industrial plants employing 311,084 workers. The industries included those engaged in producing aircraft, military vehicles, munitions, and ships. Of the 1,764 recommendations made, approximately 400 had been complied with at the end of the fiscal year. As a result of these services, conditions of employment were definitely improved for more than 300,000 workers in privately owned defense industries.

At the request of the Surgeon General of the Army, systematic investigations of all industrial establishments operated by the War

Department were also undertaken. At the end of the fiscal year, 11 of the 30 establishments certified for study had been investigated, and specific recommendations for improving working conditions had been made.

COOPERATION WITH OTHER FEDERAL AGENCIES

At the request of other Federal agencies, the Public Health Service provides consultation services to such agencies on matters pertaining to health. In some instances the Service details officers to assist other Federal agencies in carrying on health activities. During the year, advice and assistance was given to many governmental departments, bureaus, and independent agencies including the following: Bureau of Agricultural Engineering and Chemistry, Bureau of Prisons, Civil Aeronautics Authority, Coast Guard, District of Columbia, Export-Import Bank of Washington, Farm Security Administration, Federal Housing Administration, Food and Drug Administration, Home Owners' Loan Corporation, Housing Authority, Immigration and Naturalization Service, Lighthouse Service, Maritime Commission, National Forest Service, National Park Service, National Resources Planning Board, National Training School for Boys, National Youth Administration, Navy Department, Office of Indian Affairs, Procurement Division of the Treasury Department, Rural Electrification Administration, Social Security Board, Soil Conservation Service, Tennessee Valley Authority, War Department, Weather Bureau, and Work Projects Administration.

COOPERATION WITH OTHER FEDERAL AGENCIES IN THE ADMINISTRATION OF MEDICAL CARE PROGRAMS

Several Federal agencies have requested and received aid from the Public Health Service in administering programs of medical care and related services. During the fiscal year, one officer was detailed to the Social Security Board, one to the National Youth Administration, and two to the Farm Security Administration for services of this type. Eight officers were detailed to the central headquarters and the six field stations of the Office of Indian Affairs to administer the medical care program maintained for Indians under Government care. In addition, one officer acted as consultant to the State welfare department of Washington in connection with a program of medical care for the medically needy. Another assisted the State welfare authorities of Minnesota in a study of tuberculosis control methods.

NATIONAL YOUTH ADMINISTRATION HEALTH PROGRAM

During the year, the officer assigned to the Social Security Board was also in charge of the medical care program of the National Youth Administration. During the latter half of the year, he was assisted by a second officer.

The objectives of the N. Y. A. program are as follows:

1. A physical appraisal by means of a thorough health examination of every youth assigned to the N. Y. A. out-of-school work program, to be used as the basis for proper job placement, counseling, and correction of health defects.

2. Correction of health defects found among youth employed on resident-center projects through the use of health facilities provided by the N. Y. A. and through the maximum utilization of available community resources; follow-up referral services for youth in need of corrective measures who are employed on nonresident projects so that they may obtain needed services from private physicians, dentists, and community health agencies.
3. Technical advice and assistance with respect to all N. Y. A. efforts having a bearing on the health of young workers, such as health education, nutrition, sanitation, physical development, and recreation.

N. Y. A. health programs have been organized in all States, the District of Columbia, Puerto Rico, and New York City. Each State program is under the supervision of a State health consultant who is either the State health officer or a private physician interested in youth and public health. Each State health consultant is aided administratively by a full-time State health supervisor. Many States have found it necessary to appoint area health supervisors to direct programs at the local level. Examining physicians and dentists are appointed by the State youth administrator and are compensated on a per diem basis. Cooperative relations have been established and maintained in most States with the State departments of health, the State and local medical and dental societies, and voluntary health agencies.

Results of the examinations are recorded and tabulated by a unit cosponsored by the Division of Public Health Methods of the National Institute of Health. As of the week ended June 27, 1941, 82,364 examination records had been received by the tabulating unit and many more were being held in the States pending receipt of laboratory reports and other data. Analysis of the first 10,000 completed examination records indicated that while about 80 percent of the boys and girls employed by the N. Y. A. are fit for any type of work, approximately 9 out of 10 have health defects, many of which will have an unfavorable influence on future employability.

While most of the defects discovered could be remedied with proper treatment, 25 percent of the youth examined reported that they had never before visited a dentist and 18 percent stated that they had never before been seen by a physician. On the basis of data provided by the program so far, it is believed that less than 50 percent of N. Y. A. youth can obtain needed medical services either with their own resources or through referral to existing health agencies and clinics. Extension of the N. Y. A. service to include a limited program for correction of remediable defects, particularly dental defects, as well as expansion of resident-center projects for physical rehabilitation, would go far towards meeting the needs of the large proportion of youths for whom no present solution exists.

FARM SECURITY ADMINISTRATION HEALTH PROGRAM

The health program of the Farm Security Administration includes the following activities:

1. A medical care program for the low-income families who borrow from the Farm Security Administration.
2. A medical care program for needy migrant agricultural workers.
3. Environmental sanitation activities in resettlement project communities, migrant camps, and among rural rehabilitation borrower families.
4. Health and nursing services for approximately 40 resettlement project communities.

The medical care program for low-income farm families was expanded during the year. At the end of the fiscal year, more than 700 medical care units were in operation, covering more than 800 counties and serving more than 106,000 families, an increase of approximately 33 percent over the number of families served the preceding year. Almost 200 dental care units were in operation, covering about 200 counties and serving approximately 30,000 families. Less than 4 percent of the medical and dental care programs inaugurated have been discontinued.

STATISTICAL AND ANALYTICAL STUDIES

During the year, the activities of the Statistical Section of the Division were divided between the operation of a large Work Projects Administration clerical unit located in Philadelphia, work on a number of statistical and analytical studies, and development of improved operating procedures.

STATISTICAL STUDIES

The work of the Philadelphia unit consisted chiefly of the transfer of material from basic source records to punch cards as a basis for studies and reports prepared by the regular staff of the Division. Material processed included data concerning: (1) The movement of physicians in the United States during the period 1923-38; (2) the distribution of physicians in the United States in 1940; (3) the grant-in-aid programs under title VI of the Social Security Act and the Venereal Disease Control Act for the years 1936 to 1940 as portrayed by financial documents submitted by the States to the Public Health Service; and (4) the distribution of registered nurses in the United States in 1940 and their availability for national defense purposes.

In cooperation with the Division of Public Health Methods of the National Institute of Health, the following statistical reports dealing with hospitals were prepared and issued: Factors That Influence Hospital Occupancy; Financial Support of Hospitals Controlled by State and Local Governments; and Hospitals Existing Singly in Counties Have Similar Financial Structure.

DEVELOPMENT OF IMPROVED OPERATING PROCEDURES

For the past five years, the Division has maintained a small auditing staff to check the propriety of grant-in-aid expenditures by the States. This staff audits the grants made under the Venereal Disease Control Act as well as those made under title VI. Experience has shown a need for a more adequate auditing program as well as consultation services to the States on other fiscal and management procedures pertaining to the grant-in-aid program. Accordingly, specially qualified personnel were recruited for this type of work, and an accountant's field manual outlining suggested auditing procedures was prepared. Also prepared was a detailed manual of instructions for the submission of budget and expenditure documents to the Public Health Service. This manual is a codification of the best budgetary techniques developed by the States individually during the five years of experimental operation. Both manuals will be revised as currently required

in order to provide State health department personnel and the consultants and auditors of the Public Health Service with a common understanding of the requirements of the Federal grant-in-aid program.

During the year, a revised machine accounting system was developed and installed for better maintenance and control of all activities involved in the grant-in-aid program.

ANALYSIS OF THE DISTRIBUTION OF HEALTH SERVICES IN THE STRUCTURE OF STATE GOVERNMENT

At the request of the Conference of State and Provincial Health Authorities, the Division undertook the revision of Public Health Bulletin 184, "Health Departments of the States and Provinces of the United States and Canada," a comprehensive report on the organization, policies, functions, and expenditures of State and Provincial health departments. The last edition of this bulletin was published in 1930 and has become obsolete. The revision will be entitled "The Distribution of Health Services in the Structure of State Government."

Whereas previous editions of Bulletin 184 dealt only with public health activities of State health departments, the edition now in preparation will include the functions of all State agencies insofar as they are concerned with health. Thirty-five separate categories of activity currently recognized as having health significance were selected for investigation and are being traced in all their ramifications through the entire governmental structures of the States. In the case of each activity the following questions are considered: What is being done by the State? Which agencies are doing it? How many and what classes of persons are employed to do the work? How much is it costing? Only activities at the State level are included. The survey covers the 48 States, Alaska, Hawaii, Puerto Rico, and the Virgin Islands. As individual sections of the study are completed they will be published in Public Health Reports.

PUBLIC HEALTH NURSING CURRICULUM STUDY

In cooperation with the National Organization for Public Health Nursing, the Nursing Section of the Division engaged in a study of public health nursing curricula. With the aid of 15 committees made up of persons associated with the universities offering courses of study in public health nursing, the knowledge and skills required by nurses in the various special fields of nursing were analyzed. The committee reports were edited and referred to authorities in nursing and related professional fields for review and comment. When returned they will be used in the preparation of a curriculum guide for schools of public health nursing.

CONFERENCES OF THE SURGEON GENERAL WITH STATE AND TERRITORIAL HEALTH OFFICERS

In accordance with the act of Congress, July 1, 1902, the Surgeon General annually calls a conference of State and Territorial health officers. A special conference may be called whenever the Surgeon General believes it to be in the interest of public health.

SPECIAL CONFERENCE, SEPTEMBER 16-17, 1940

A Special Conference was called to convene in Washington, D. C., on September 16 and 17, 1940, in order to consider and discuss the public health problems arising out of the national defense program. Representatives of 47 States, the District of Columbia, and Alaska, as well as representatives of other Federal agencies and of professional and voluntary agencies, were present.

The Special Conference adopted reports presented by the following committees: Committee on Public Health in Areas of Mobilization; Committee on Professional Education and Qualifications of Public Health Personnel; Committee on Venereal Disease Control; Committee on Hospital and Medical Care; Committee on Federal Relations, Conference of State and Provincial Health Authorities; and the Committee on Interstate and Foreign Quarantine.

The following subjects were presented and formed the basis for discussion: The Status of Federal Health Legislation, Control of Selected Communicable Diseases, Health Services for Enrollees of the National Youth Administration, Health Administrative Problems Arising out of Mobilization, Administration of the Selective Service Act, Pertinent Needs in Industrial Hygiene, Physical Rehabilitation of Registrants Disqualified for Duty with the Armed Forces, Serologic Tests of Registrants for Military Service, and Health Aspects of Civil Defense.

THIRTY-NINTH ANNUAL CONFERENCE, APRIL 29 AND MAY 2, 1941

The Thirty-ninth Annual Conference of State and Territorial Health Officers with the Public Health Service convened in Washington, D. C., on April 29 and May 2, 1941. Representatives from 47 States, the District of Columbia, Alaska, Hawaii, Puerto Rico, and the Virgin Islands were present.

The Conference adopted reports presented by the following committees: Committee on Professional Education and Qualifications of Public Health Personnel, Committee on the Social Security Program, Committee on Hospital and Medical Care, Committee on Venereal Disease Control, Committee on Interstate and Foreign Quarantine, and the Committee on Records and Reports. The program also included presentation of the following papers: Medicine in England Now; Special Problems in Our Health Defenses; Activities of the Health and Medical Committee of the Federal Security Agency; Pending Federal Health Legislation; Coordination of Health, Welfare, and Related Activities in National Defense; Medical Problems in the Administration of the Selective Service Act; Community Health Services and Facilities; Progress in the Industrial Hygiene Program in the National Defense; and Present Status of the Venereal Disease Control Program in Mobilization and National Defense.

The following committees were appointed: Committee on Professional Education and Qualifications of Public Health Personnel, Dr. Walter L. Bierring, chairman; Committee on the Social Security Program, Dr. A. T. McCormack, chairman; Committee on Hospital and Medical Care, Dr. Edward S. Godfrey, chairman; Committee on Venereal Disease Control, Dr. Robert H. Riley, chairman; Com-

mittee on Interstate and Foreign Quarantine, Dr. A. J. Chesley, chairman; Committee on Records and Reports, Dr. W. C. Williams, chairman.

RECOMMENDATIONS

The emergency health and sanitation program for assisting State and local health departments to meet the added demands growing out of the current national emergency has proved to be very effective. Additional funds should be made available so that the Federal Government may increase its contribution as the need becomes more acute.

The need for extension and intensification of industrial hygiene service far exceeds the present resources of Federal, State, and local health agencies. Inasmuch as a large part of the industrial expansion arises out of contracts for war materials it is fitting that the Federal Government should increase its contribution towards the solution of industrial hygiene problems.

Both typhus fever and plague infection have gradually increased during the last decade to a point where they are serious public health problems in certain areas of the country. In the cities and the more highly cultivated rural areas, the problem of suppression of both these infections is bound up with control of the domestic rat population. It is recommended that funds be made available to assist the States in a concerted attack on domestic rats in important areas.

A recent intensive survey of the water resources of the Ohio River basin measured the possible uses of the river and its tributaries for water supply, disposal of wastes, recreation, and fish and wildlife. It is recommended that funds be made available for similar studies of other bodies of water and drainage areas and for inauguration of a control program which will insure proper development and balanced usage of water resources in respect to health and sanitation. It is recommended that the mandatory provisions regarding State merit systems of personnel administration under the public assistance titles of the Social Security Act be made applicable to title VI. At the present time, the Public Health Service is empowered to act on merit systems submitted by the States only under the authority of its general powers to prescribe rules and regulations for the administration of title VI. Statutory authority would facilitate the relationship of the Public Health Service with the States.

NATIONAL INSTITUTE OF HEALTH

(DIVISION OF SCIENTIFIC RESEARCH)

Assistant Surgeon General L. R. THOMPSON, Director

The fiscal year just ended marked the occupation of all buildings on the site near Bethesda, Md., where the Institute now functions to its full capacity. Owing to the national emergency a number of defense projects have been undertaken, these being assigned to the Divisions especially suited for their prosecution.

A report of the activities of the National Institute of Health follows:

DIVISION OF BIOLOGICS CONTROL

Senior Surgeon M. V. VELDEE in charge

As in previous years the major activity of the Division has been the enforcement of the Biologics Act. During the year 3 licenses were canceled without prejudice and 5 new licenses granted, giving a total of 71 which were in force at the end of the fiscal year. However, 15 of the total are held by foreign firms and because of world conditions the majority of these are inactive. The licenses cover a total of 168 individual substances and in turn these substances are used in various combinations so that actually the number of licensed products offered in interstate commerce is many times greater.

The control of biologic products involves investigations into methods of manufacture, standardization, and sterility testing. The results of such work are reflected in the quality of the products offered for sale and in the protection afforded the public.

Owing to the expansion of the armed forces, increases have occurred in the control measures for certain biologics destined for these forces and in the development of standards for others.

The introduction of effective chemotherapeutic agents has greatly influenced the use of certain biologics. This is particularly true of antipneumococcic, antistreptococcic, and antimeningococcic serums.

Arsenical preparations.—Studies on the spirocheticidal activity of the organic arsenical preparations in experimental syphilis in rabbits, with reference to the chemotherapeutic ratio, have been continued. Results indicate sulfarsphenamine to be the most effective, neoarsphenamine less effective, and arsenoxide least effective in curing the experimental infection.

Variation in the virulence of the *Treponema pallidum* as a possible factor influencing the curative efficiency of the antisiphilic agent, previously observed with neoarsphenamine, was noted also as influencing the sterilization activity of sulfarsphenamine and arsenoxide.

Twenty lots of neoarsphenamine, representing the several American products, effected cures with single doses in 95.5 percent of in-

fectured rabbits with 40 mg. per kilogram, 75.6 percent with 30 mg., and 37.5 percent with 20 mg. per kilogram of body weight.

Continued improvement in the stability of nearsphenamine has been noted as indicated by the "heat test" (stability at high artificial temperatures), solubility test, and moisture content determinations.

The survey of sulfarsphenamine with respect to its clinical safety in comparison with nearsphenamine has been continued and will include approximately 10,000 doses of each product.

Rabies.—A mouse test for standardizing the potency of antirabies vaccines has been submitted to the licensed manufacturers of human-type vaccines and technical advice given to those performing the test. As the result of this testing, those laboratories which have found their vaccines to be of low potency have been consulted as to changes in procedure likely to increase it. Studies are being continued on methods of improving the antigenic quality of rabies vaccines.

Tetanus.—Two doses of alum-precipitated tetanus toxoid given at an interval of 2 months were found only slightly more efficient than two doses at an interval of 1 month in developing a basal immunity against tetanus as determined by antitoxin titrations in human subjects. Of 110 persons studied none failed to develop an adequate antitoxin titer upon receiving a stimulating dose of tetanus toxoid 1 year after the primary immunization.

Meningococcus.—A procedure for the performance of the mouse-protection test in standardizing antimeningococcic serum has been developed and is now under trial by the manufacturers of this serum. The research work which forms the basis for this protection test was completed during the fiscal year and has been published.

All the polyvalent antimeningococcic serums submitted to the National Institute of Health by manufacturers for approval have been evaluated by the mouse-protection method, by the plate-precipitin method, and by agglutination at 37° C. and at 56° C. Most polyvalent serums show protection against Group I meningococci whereas protection against Group II is either poor or altogether absent. Further studies of Group II strains are in progress in an effort to improve the protective value of the corresponding antiserum. On the basis of laboratory studies potent antiserum can be produced in the rabbit.

A study of the incidence of the serologic groups of meningococci from meningitis occurring in different parts of the country was continued.

Hemophilus influenzae.—The high incidence of *Hemophilus influenzae* among cases of meningitis studied in children has continued.

A mouse-protection test for determining the potency of antiserum has been developed. Using this test an investigation was undertaken to determine the potency of serums produced by manufacturers. The rabbit serums were much superior to the horse serum. The best horse serum (unconcentrated) was only about one-tenth as potent as the best rabbit serum (concentrated) while others were only about one-thousandth as potent. Clinical reports bear out the superiority of the rabbit antiserum.

A comparative study of the action of several drugs on Type b *Hemophilus influenzae* both *in vitro* and *in vivo* is in progress.

Pneumococci.—Typing serum: Studies on the unclassified strains of pneumococci from the standpoint of their relationship to the recognized types and their incidence have been continued. Some strains have been found to be so closely related to one of the recognized types that for practical purposes they can be considered as belonging to the recognized type; others have been found to deserve the status of new types. In collaboration with the Division of Public Health Methods a new type of pneumococcus was separated which was more prevalent in a survey in one State than many of the recognized types.

Therapeutic serums: Standard control serums for comparative mouse-protection tests have been distributed for Types I, II, V, VII, and VIII. The potency of antipneumococcic serums for the other types has been determined by mouse-protection tests or by antibody nitrogen content. Various factors which influence the mouse-protection test are being investigated. These investigations are for the purpose of standardizing the mouse-protection test and for determining the potency of serums of types for which standard control serums have not been established.

Perfringens toxoid.—Work on a method for evaluating the anti-toxin binding power (Lb) of perfringens toxoid by the human serum opacity reaction has been completed and published. Good correlation was found between the values obtained by this test and the actual antigenicity as shown by animal inoculation.

Work has been completed on a study having to do with the preparation of a perfringens toxoid with high immunizing properties and with low nitrogen content. The toxoids were prepared in a casein hydrolysate meat medium precipitated with 70 percent saturation $(\text{NH}_4)_2\text{SO}_4$, dialyzed and reprecipitated with 1 percent alum. Values as high as 4.5 to 5.0 units per cc. of serum were obtained after immunizing guinea pigs with two 1 cc. injections given 3 weeks apart.

Typhoid.—Methods of measuring the antigenic properties of typhoid vaccine are being studied. It has been demonstrated that a mouse-protection type of laboratory test can be devised which will indicate, more accurately than agglutinin production in the rabbit, the value of the vaccine as an immunizing agent in man. It is planned to apply such a test to all typhoid vaccines before release.

Hemolytic streptococcus diseases.—A 4-year study of the value of small intradermal injections of purified and tannic acid precipitated scarlet fever toxin on the Dick reaction and on the prevalence of clinical scarlet fever has been completed and the findings published. Such injections do not cause significant reactions in the injected children and 80 to 90 percent of the Dick positive persons so treated became negative. The morbidity rate per 1,000 in the 6-9-year group (inclusive) was 9.29 in the control, 0.87 in the natural Dick-negative group, and 1.47 in the Dick positive but treated group. In the 10-15-year groups all rates were lower but of essentially the same ratio. The study also indicated that a negative Dick reaction acquired through active immunization with a single strain toxin was equal to one acquired through natural exposure. The practicability of this form of active immunization is further attested by the mildness of the reactions following the immunization injections and an increasing interest on the part of parents and school authorities.

DIVISION OF CHEMISTRY

Professor CLAUDE S. HUDSON in charge

Sugar researches.—Fundamental studies relating to the structure and configurations of the carbohydrates were continued. They included a continuation of the researches on anhydro sugars. A new anhydride of D-galactose has been obtained and its structure established. Experimental proof was obtained of the structure of the previously reported anhydro-D-mannosan. A similar anhydro-D-galactosan has been obtained and its structure studied; and the anhydrides, D-glucosan and D-galactosan, have been made available by a new and convenient procedure, namely, the pyrolysis of lactose.

The expected usefulness of the previously reported new acetone-D-mannosan in syntheses, particularly in those of disaccharides possessing the 4-linkage, was demonstrated experimentally by the synthesis of the disaccharide, 4- $[\beta$ -D-glucopyranosido]-D-mannose, through condensation of the acetone-D-mannosan with acetobromo-D-glucose.

A comparatively large number of pure crystalline glucosides and related compounds were prepared in connection with a study of the correlation of the configurations of certain α - and β -glycosides with those of levoglucosan and other anhydro derivatives of the sugars.

The study of D-altrose and its derivatives was continued. Work was completed on seven new crystalline derivatives. α -Methyl-D-altroside, of $[\alpha]_D^{20} + 125.8^\circ$ in water, has been proved by periodic acid oxidation methods to possess the α -configuration and a pyranoside ring; and improvements have been developed in the series of reactions for the transformation of α -methyl-D-glucoside to crystalline α -methyl-D-altroside.

The structural studies on acetals of sugar alcohols was continued. A new dibenzal dulcitol and several of its derivatives were isolated in pure condition. A diacetone-L-fucitol was prepared and found to have the structure 2, 3, 4, 5-diacetone-L-fucitol. The structure of diformal dulcitol has been investigated, several of its derivatives prepared, and results obtained which promise to be of value in structural studies. The problem of the structure of dibenzylidene dulcitol was completed, proving the benzylidene groups to be attached at the 1-3:4-6 positions and correlating its structure with that of di-o-nitrobenzylidene dulcitol. Acetic anhydride was found to be a suitable solvent in the case of the iodination of β -ditosyl-diacetone-dulcitol and tosyl-diacetone-fucitol, thus overcoming the danger of explosions when acetone is used as the solvent.

Other researches in this field included the preparation of a new methylated mannose, establishing its structure and preparing several of its derivatives in pure crystalline form; studies of the reaction of tosyl groups in various sugar derivatives with fused potassium acetate and of the reaction of "rearranging solution" with various types of linkages in sugar derivatives; improvements in the synthesis of acetylated phenyl glucosides; a new use of zinc chloride as a catalyst in rearranging acetylated beta-phenyl-D-glucoside to the crystalline alpha isomer; an investigation on the bromine oxidation of aldoses in pyridine solutions as a simple and rapid procedure for the prepara-

tion of the corresponding aldonic acids; and a continuation of the study of sedum plants as a source of sedoheptulose.

Researches on starch.—The starch researches included a study of the rate of enzymotic digestion by *A. macerans* amylase of modified starches, the results showing the rates for the following in decreasing order: Gelatinized corn starch, α -amylose, whole corn starch, β -amylose, and alkali solubilized starch; a study of the rate of periodate oxidation, the results showing the following descending order: α -amylose, alkali solubilized starch, whole corn starch, and β -amylose; and studies on the solubilization of starch by various reagents. It was found that alkali solubilization is catalyzed by pretreatment of the starch with copper acetate but degradation of solutions of the solubilized starch is inhibited by the presence of traces of copper acetate. Results of a study of the solubilizing action of solutions of hydrochloric acid in various solvents showed that the solubilizing efficacy was greatest for the ethers and carbonyl solvents and least for the alcohols.

In connection with these studies an investigation was carried out on the action of alkali on L'-methoxy-L-methyl-diglycolic aldehyde. The results showed the reaction to be similar to the Cannizzaro type. The hydrolysis products were identified as glyoxylic acid, propylene glycol, glycolic aldehyde and lactic acid.

Enzyme researches.—Investigations have been completed establishing the conditions for obtaining highly purified invertase solutions from yeast by means of bentonite as an adsorbent. The new factors found to be important were the temperature during autolysis and the conditions during aging. The method has been applied successfully to yeasts from six different sources.

Studies on the direct precipitation of invertase by means of acetic acid indicated that this precipitation is due to the presence of nucleic acid and appears to be a mutual precipitation occurring when this mixture of invertase and nucleic acid is adjusted to the proper pH. It was found that better results could be obtained in invertase purification with the picric acid precipitation method by applying it after a preliminary acetone precipitation.

The properties of the preparations obtained by the various methods studied suggest that invertase may be associated originally with a carbohydrate-protein complex, the carbohydrate fraction being hydrolyzed under the conditions of the present investigations.

Work was also carried out, in cooperation with the National Bureau of Standards, on a problem designed to correlate the action of the enzyme β -glucosidase from sweet almonds with the structure of the aglucons in a series of glucosides.

Chemico-bacteriological studies.—Biochemical studies of starch-hydrolyzing bacteria were continued. The amylases of *A. macerans* and *A. polymyxa* were purified and compared by studies of reaction velocity in relation to enzyme concentration, temperature, and hydrogen ion concentration. Cultural conditions for maximum enzyme production and optimum conditions for starch hydrolysis have been worked out for both aerobacilli and many cultures of each species were compared. The iodine test for crystalline dextrins was developed into a simple and rapid method for the identification of cultures of *A. macerans* and the differentiation of this organism from

other starch-hydrolyzers, particularly from *A. polymyxa*, which is very similar culturally and morphologically but produces a type of amylase converting starch to reducing sugars instead of crystalline dextrins; and preparations of *A. macerans* enzyme have been obtained which digest about 1,000 times their weight of starch, as compared with only about 7 times for the original.

Biochemical dental studies.—Studies were carried out, in cooperation with the Division of Infectious Diseases, on the effect of various concentrations of fluoride in drinking water on rat caries. A minimum of 10 parts per million of fluorine as sodium fluoride in the drinking water was found to give partial protection against occlusal rat caries.

Studies on fluorides in water.—The studies on fluorides in drinking water were continued. In cooperation with the Division of Infectious Diseases, 227 samples of drinking water were received from various localities in the United States for chemical analyses, including fluoride determinations, for the purpose of ascertaining possible correlations between the chemical composition of the drinking water, especially the fluoride concentrations, and the observed dental caries.

Analytical work.—There were carried out about 175 various analyses of miscellaneous material; 50 analyses of arsphenamine and nearsphenamine; 6 examinations of pharmaceuticals; 77 preparations of standard solutions; and 173 micro determinations in connection with the sugar researches.

DIVISION OF CHEMOTHERAPY

Surgeon W. H. SEBRELL, JR. in charge

The new Division of Chemotherapy was established during the year. The functions and personnel of the following were transferred to the new Division: Division of Pharmacology; nutrition unit of the Division of Chemistry; and the chemotherapy unit of the Division of Infectious Diseases. A new unit for the purpose of testing antimalarial drugs was also set up within the Division and the field station for the nicotinic acid study was moved to Augusta, Ga.

Systematic studies on the synthesis of drugs for the treatment of malaria were started. These studies have produced 112 compounds which were chosen as representative of a large number of heterocyclic nuclei in an attempt to find new leads to chemical types having plasmodicidal action. Toxicity studies on all these drugs have been carried out. In the new malaria testing unit mosquito colonies of *Culex pipiens*, *Aedes albopictus*, and *Aedes aegypti* were established. Two strains of *Plasmodium catheimerium* have been established in canaries, one of *P. lophurae* in ducks, and one each of *P. knowlesi* and *P. cynomolgi* in monkeys. Sporozoite infections with *P. catheimerium* were developed in *Culex pipiens*. In addition 24 of the new compounds were tested for action on avian malaria. The results were negative.

Studies on the human requirement for nicotinic acid and riboflavin were continued at the field station at Augusta, Ga. Observations are being continued on patients with deficiencies in the vitamin B complex in cooperation with the University of Georgia Medical School.

The bacterial growth method of assay for riboflavin was modified for urine analysis and successfully applied. Data were obtained on the excretion of riboflavin under varying conditions and on the human riboflavin requirement.

A method of assay for nicotinamide and related substances by the bacterial growth method was developed and applied to body fluids. Studies on the nicotinic acid content of food are being continued.

The deficiency in the diet causing necrotic adrenals in rats was found to be a pantothenic acid deficiency. This vitamin proved to be active both in the prevention and in the cure of the deficiency syndrome.

Cirrhosis of the liver has been produced rapidly and consistently in rats by means of a deficient diet. An attempt to identify the factor or factors responsible is in progress.

A study is being conducted on the relationship between marginal vitamin deficiencies and susceptibility to infection.

The study on the experimental pellagra-preventive value of pyrazines was completed.

Experiments on anemia in dogs due to dietary deficiencies, on the thiamin requirement of rats as affected by the ingestion of alcohol, and on the nicotinic acid requirement of dogs as affected by increased metabolism are in progress.

The study on the factors governing the vitamin C content of plants was continued.

Supervision over the mineral analyses of Tennessee and Alabama foods was continued and these studies were extended in the Tennessee Valley Authority nutrition laboratory.

Nutrition activities in various State health departments were observed and advice on the program given to the State health department nutritionists.

A unit for studies in the field of gerontology was set up and a national advisory committee created. A preliminary survey of research activities in this field was conducted and at a meeting of the advisory committee plans for further experimentation were discussed and a small project started.

The effect of dietary protein on the toxicity of sulfanilamide was studied. A liberal protein intake reduced the mortality rate and the incidence of anemia in chronic sulfanilamide poisoning in rats. Inclusion of cystine in the low protein diet had no favorable influence, while methionine reduced the mortality rate though it did not prevent anemia. Studies on sulfanilamide content of the blood showed higher levels of the drug in animals on a low protein diet. Experiments on the therapeutic effectiveness of the drug indicate a higher degree of effectiveness against streptococcus and pneumococcus infections in mice on low protein diets. The degree of effectiveness was related to the concentration of the drug in the blood. Experiments in progress indicate that fasting tends to decrease the rate of conjugation of the drug, favors higher blood levels, increases the retention, and diminishes the excretion of the drug.

Eight new chemical compounds were synthesized and their pharmacologic and chemotherapeutic properties were studied.

The effects of a series of aromatic nitro and amino compounds were studied in experimental trypanosomiasis in mice. None of the com-

pounds proved highly effective. Some activity was noted in the benzoic acid derivative with the nitro group in the meta position. No activity was exhibited by similar compounds with the nitro group in the ortho or para position.

The tuberculostatic action of a large series of sulfonamides and certain phosphorus analogues was studied against the human strain H 37. Inhibition of growth *in vitro* of tubercle bacillus by sulfathiazol, para-aminobenzenephosphonic acid, di-amino-di-phenyl-sulfone, p-p'-di-amino-di-phenyl-sulfone-N-N'-di-dextrose-sulfonate was noted. All the other compounds examined had slight or no inhibiting action.

Studies were made of the effects of the foregoing compounds in experimental bovine tuberculosis in rabbits and human tuberculosis in guinea pigs. These experiments appear to indicate little or no effect for the first two compounds and apparently a favorable influence for the last two.

The growth and effects of the tubercle bacillus on the chorio-allantoic membrane of the chick embryo have been studied with a view to developing new methods to determine the tuberculocidal action of drugs. Implantation of tubercle bacilli on the surface of the membrane resulted in tubercle formation within 4 to 6 days. The incidence of tubercle formation following the implantation of bacilli of different degrees of virulence indicates a parallelism between virulence and extent of infection. The results suggest that the method may be useful to determine within a few days the tuberculocidal effectiveness of a drug or its ability to attenuate the virulence of a given strain of tubercle bacilli.

It has been previously shown that the toxic effects of ingested selenium can be mitigated by high protein diet. During the past year attempts were made, without success, to mobilize the stored selenium from the body depots.

The possibility of some amino acid being concerned with the detoxification of ingested selenium has been investigated. Lysine, cystine, methionine, serine, glutamic acid, and aspartic acid failed to show any favorable effects. Work with other amino acids is being continued.

It has long been recognized that many of the side actions of morphine are related to its effects on the parasympathetic nervous system. This is referred to as the cholinergic action of morphine. Cholinergic drugs often produce their effects through an inhibiting action on choline-esterase. Therefore, the effects of morphine and derivatives on the choline-esterase of serum and tissues were studied. The inhibiting action of morphine on serum choline-esterase has been demonstrated, and the effects of morphine on the choline-esterase of brain, liver, and other tissues are being investigated. In the course of this work, an enzyme capable of deacetylating heroin and other acetyl derivatives of morphine has been discovered. The possible significance of this enzyme as a detoxifying mechanism is being investigated.

A series of samples of digitalis purpurea cultivated in New Hampshire and harvested and processed under a variety of experimental conditions was assayed. Data were obtained indicating that digitalis of a satisfactory potency can be grown in New Hampshire, prob-

ably in amounts sufficient to supply our normal requirements. Studies on the relation of potency to the drying process indicate that a temperature up to 140° F. is satisfactory, while temperatures of 200° F. or over decrease the potency of the leaf, the decrease in potency being proportional to the rise in temperature.

DIVISION OF INDUSTRIAL HYGIENE

Medical Director J. G. TOWNSEND in charge

The activities of the Division of Industrial Hygiene in the protection and improvement of the health of the working population have increased and expanded incident to national defense efforts. On February 1, 1941, Medical Director J. G. Townsend was made Chief of the Division. Subsequently there were established three sections, States Relations and National Defense Activities, Research, and Dermatoses Investigations, and three units, medical, engineering, and statistical, which function as service supply to the three sections, but which also have certain nonrelated functions.

FIELD INVESTIGATIONS AND LABORATORY RESEARCH

The laboratory investigations and field studies on such toxic substances as carbon monoxide, chlorinated hydrocarbons, lead, mercury, arsenic, selenium, manganese, pneumoconiosis-producing dusts, and others have given the Division a background of fundamental knowledge for the present emergency. Toxicological research problems at present consist of those pertaining to explosives, solvents, metals used in airplane construction, munitions, and components of synthetic rubbers and plastics. Other investigations relating to the effects of high altitude and crowded living conditions are in progress as well as the development of field instruments for the detection and measurement of toxic gases.

Heavy metals.—Lead: The study of the effects of lead arsenate exposure on orchardists and consumers of sprayed fruit was completed and the results published in Public Health Bulletin No. 267. Experimental studies of the relative toxicity of the molecular components of lead arsenate, the deposition and removal of lead in the soft tissues, the toxic contaminants of drinking water, a rapid method for the micro-analysis of lead, the effects of soluble arsenates upon lead absorption, the identification of lead in bone tissue, the distribution of lead in bone tissue, and the protein intake in relation to lead poisoning were completed. In the light of these investigations the Public Health Service expressed the opinion that a tolerance of lead arsenate on apples and pears might be placed at 0.05 grains per pound for lead and for arsenic (As_2O_3) at 0.025 grains per pound without endangering the health of the consumer. The Surgeon General designated a committee of scientists to advise him whether or not at this time there is available sufficient scientific evidence to permit the establishment of legal tolerances for arsenic, lead, and fluorine at definite figures, even though these may be more liberal than the above existing administrative tolerances, and to designate such figures. The Committee met and unanimously submitted, among others, the following recommendations: (1) In the judgment of the Committee, there is

substantial evidence for a hearing looking toward the establishment of a legal tolerance for lead and arsenic on apples and pears; and (2) in the judgment of the Committee there should be allowed on apples and pears the minimal amount of arsenic and lead which the industry can practically meet and in no case to exceed arsenic 0.025 grains per pound and lead 0.05 grains per pound. Other studies relative to the toxicity of lead and its compounds, such as lead azide, are in progress. The trend of the experimental work in general has been toward elucidation of the mechanics of lead absorption, deposition, and elimination, the influence of arsenates, and the combined effect of lead and the arsenate group.

Mercury: The study of the incidence of mercurialism in the felt hat industry was completed and results published in Public Health Bulletin No. 263. In cooperation with the Bureau of Standards an investigation was made of possible occurrence of mercury poisoning among laboratory workers. No cases of mercurialism were found where exposures to mercury were below 1 mg. per 10 m³ of air.

Vanadium and beryllium: These products used in airplane and munition alloys are being investigated to determine and control the health hazards associated with their use.

Selenium: The use of selenium in certain defense industries as a nitration-process catalyst has increased. Studies have been completed on the subacute exposure to hydrogen selenide and the toxic effects of seleniferous dusts.

Organic compounds.—Toluene: To establish the maximal permissible concentration of toluene for continued exposure of humans, three volunteers were exposed for 8-hour periods to each of the following concentrations per million parts of air: 50, 100, 200, 300, 400, 600, and 800. Blood pressure, pulse rate, respiratory rate, and respiratory volume were measured before and at the end of the exposure. Psychologic tests were performed and the condition of the nervous system was studied. The excretion of hippuric acid in the urine and the concentration of toluene in the blood at the end of the exposure were determined. The results show that exposures of such intensity do not produce definite changes of the respiration or circulation but may affect the responsiveness of the central nervous system, resulting in fatigue, incoordination, and lack of judgment. The excretion of hippuric acid in the urine and the amount of toluene in the blood increase with the intensity of the exposure. The results indicate that concentrations above 200 parts per million have definite detrimental effects on the psychologic functions.

Carbon monoxide: Studies on the mechanism and treatment of carbon monoxide poisoning as observed in dogs anesthetized with sodium amylal were completed. These studies have shown that there is a sharp rise of the spinal and intracranial pressure which decreases after discontinuation of the exposure and which after a latent period of from 2 to 3 hours shows a secondary rise; it was shown that these changes of pressure are closely associated with changes in the circulation. In these changes the central vasomotor apparatus, the heart, and the peripheral blood vessels are involved.

Vinyl cyanide: Vinyl cyanide, one of the starting materials used in producing one or more of the synthetic rubbers, is being studied since little is known regarding its toxic action. Similar toxicologic

studies are being made on styrene which is extensively used in making transparent plastics.

Establishment of standards of toxicity.—In cooperation with the American Standards Association, in the establishment of maximal permissible concentrations of toxic gases, dusts, and vapors, standards have been established for benzene, hydrogen sulfide, carbon disulfide, and carbon monoxide. These standards define the amount of the toxic substance which may be permitted in the air of workplaces without harming the worker. In addition to these standards there has been prepared and published supplemental information which contains a detailed discussion of these substances with regard to potential dangers, clinical picture, pathologic changes, preventive measures, and outline of treatment.

Aviation medicine.—A decompression chamber and accessory apparatus have been placed in operation. These make possible the production of altitude-pressure equivalents up to 63,000 feet, simulating rates of ascent as great as 20,000 feet per minute, up to 40,000 feet. Oxygen breathing equipment for the use of aircraft personnel has been extensively tested for the Navy. Tests with resting and active subjects have included over-all efficiency of the apparatus at various altitudes and at temperatures down to 0° F. A study has been made of the effects of decompression at high altitudes with respect to rates of ascent, sojourn, time of exposure, oxygen treatment, and aero-embolism. Physiologic and pathologic changes induced by this exposure have been demonstrated, and important facts in the diagnosis, prevention, and treatment of aero-embolism have been determined. A study of the effect of altitude exposure on the function of the adrenal cortex is being made in collaboration with the Johns Hopkins University Medical School. In these experiments the work of others has been confirmed and extended, indicating that the adrenal cortex plays an important part in adaptation to altitude exposure. A study has been made of the effect of altitude exposure on the rate of dark adaptation and the light sensitivity threshold of human subjects. A report has been prepared and circulated among Service agencies and other authorized groups concerning the effect of exposure at 12,000 feet. A method has been devised for analyzing experimental data obtained from dark adaptation tests. Confidential reports of the results of these experiments have been submitted from time to time to the Navy. Personnel assigned to the aviation medicine project from the Medical School of the United States Navy have been given training in aviation medicine and in laboratory techniques.

Analytical services in national defense.—Methods were developed for analyzing and sampling certain war materials and explosives such as TNT and tetryl. Field samples taken in various ordnance depots and shipyards were analyzed for certain toxic air contaminants. Chemical, mineralogic, and toxicologic laboratory examinations were made on samples submitted from different States and territories where adequate State laboratory facilities were lacking. Special apparatus, such as a portable unit for determination of halogenated hydrocarbons, and special methods, such as a rapid method for microanalysis of lead, have been devised to meet the current demands for such procedures.

Cotton disease.—An apparently new disease with symptoms similar to those of influenza was observed in rural mattress-making projects

in several States and in one industrial plant, following the use of stained cotton from one section of the United States. Studies are being made to determine the causative agent. A flagellated, encapsulated bacterium producing mucoid colonies has been isolated from over a hundred samples causing the disease in humans. Studies as to the pathogenicity and identification of this organism are in progress.

Physical methods.—Analyses by spectral emission have been extended to arsenic and antimony. Analyses by spectral absorption have been applied to solvents and vapors. A study of the use of radiation from low pressure mercury vapor lamps as a means of controlling the spread of contagious diseases in crowded quarters has been initiated at the National Training School for Boys. Measurements of ultraviolet and daylight have been carried on continuously for 3 and 5 years, respectively, at 2 field stations. Development of radiation integrating devices has reached the point where the practicability of operating a large number of stations has been demonstrated. Results obtained indicate that the seasonal values for different years differ markedly; hence epidemiological studies requiring data typifying geographic locations will have to be carried over a number of years. Arrangements have been made for extending the number of points of observation through cooperation with other institutions, particularly the United States Weather Bureau. Studies of the mechanism of action of ultraviolet have included: (1) The effect of monochromatic ultraviolet radiation on nematodes, carried out in cooperation with the Division of Zoology, which has shown that pinworm eggs are much less sensitive than bacteria in the longer wavelength regions of the ultraviolet which are present in sunlight; (2) determination of the changes produced in nucleic acid by ultraviolet radiation; (3) determination of spectral absorption of different portions of fungus spores by means of the ultraviolet microscope with a view to establishing the seat of action of ultraviolet radiation; (4) determination in cooperation with the National Cancer Institute of the spectral transmission in the ultraviolet for the abdominal wall of *Drosophila melanogaster*, which showed the wall to be highly transparent in the effective regions, while the intervening tissue presented large absorption; (5) the comparison of the nucleic acid content of salivary gland chromosomes of normal and translocated forms; contrary to previous reports, affected loci exhibit no more than normal variability; (6) the effect of longer wavelength ultraviolet in the region of 3650 Å; it was shown that when present in high intensity, as in sunlight, this radiation may be an important sterilizing agent, even though many times less effective than the erythral region for the same amount of energy; (7) the determination of the characteristic action of different wavelengths in the ultraviolet in the production of genetic change for fungus spores (in cooperation with the Division of Infectious Diseases) and for *Drosophila melanogaster* (in cooperation with the Carnegie Institute of Washington).

Washington Biophysical Institute.—A study of the photoisomerization of ergosterol to establish the mechanism of production of vitamin D has included isolation of the pure photoisomers and partial photochemical determinations for vitamin D, tachysterol and toxisterol, and is being extended to lumisterol. Studies of photodehydrogena-

tion have included the production of 1,3-cholestadiene as well as 1-cholestenone. Facilities for analysis by spectral absorption have been extended: (1) By the completion of a recording spectrometer for the range from $2\frac{1}{2}\mu$ to 13μ , (2) by the construction of a recording spectrophotometer covering the visible and near infra-red to 1μ , and (3) by a device for the region of from 1 to $2\frac{1}{2}\mu$ which is nearing completion. The range of applicability of these instruments includes, among others, solvents, toxic gases, body fluids, histological dyes, and other photodynamic agents.

Dermatoses investigations.—Ten outbreaks of dermatitis were investigated; nine of these were occupational in nature. The tenth, and probably the most important because of its Nation-wide extent, occurred among wearers of fabrics finished with a new acid ester gum finish. This outbreak has led to consideration of a means whereby new compounds to be used on fabrics can be tested for skin irritative properties before being offered to the public. The outbreaks of occupational dermatitis that were investigated occurred in such varied industries and occupations as textile mills, foundries, leather tanneries, watch-case manufacture, tunnelers, air conditioning equipment operators, plate printers, handlers of resin-lined tin cans, and munitions manufacture. In each of these investigations the cause of the outbreak of dermatitis was sought and recommendations made for corrective measures. A study was also made of workmen who experienced allergic symptoms due to castor bean sensitivity.

An extensive study was made of the skin hazards in the airplane industry. Other investigations were made in the steel industry, chemical manufacturing plants, and in the oil fields.

A poison ivy preventive cream has been developed through experimental work, and extensive field trials are being conducted to test the practicability of this preparation. A new treatment method for poison ivy dermatitis using tannic acid has also been developed and published. Studies are being made of the efficacy of poison ivy immunization.

The number of consultations with industries, industrial associations, State and local health departments, research workers, physicians, and individuals regarding dermatoses problems has continued to increase; the number of consulting letters has tripled.

A bibliography with abstracts of the medical literature covering the past 5 years and related to industrial dermatoses has been published as a Public Health Bulletin. The collecting and abstracting in this connection constitute a regular activity of this Division.

Twenty-three lectures were given during the year to various types of audiences.

In the dermatoses clinic conducted for Government employees by this Office, 258 new patients and 424 return patients were examined and treated.

Sickness among industrial workers.—*Incidence of disabling sickness:* The analysis of monthly reports from a group of industrial sick benefit organizations providing sickness insurance for about 200,000 male employees was continued during the year and the results published quarterly. One of the quarterly reports inquired into the occurrence of multiple attacks of disabling sickness and injuries. It was found that 45 percent of the industrial group under study suffered

no attacks. The subject of multiplicity of attacks or "sickness proneness" will form the subject of a series of papers upon which work has already begun. A study of cancer among the employees of an oil refining company was published and showed, among other things, an annual frequency of 1.2 cases per 1,000 and a death rate of 0.78; about 70 percent of the deaths were related to the digestive system. The first paper of a series on the duration of disabling sickness has been published while the second is in press; particular attention is being directed to the annual number of cases per 1,000 persons disabling for a specified number of days, t , or more, and to the annual number of days of disability per person resulting from all disabilities contributing t days or less, the upper limit of t being 372 days. A study of tuberculosis of the respiratory system showed that the frequency moved steadily downward during 1925-33 while during the period 1934-39 the downward trend appeared to continue but at a slightly less rapid rate.

Occupational morbidity and mortality study: A report has appeared on the increasing duration of disability among a large group of workers; at the same time the frequency declined. Thus, as a measure of economic losses from disability, the average frequency rate may lead to erroneous conclusions. Two papers, one on the regional variation of sickness, and the other on sickness among glass workers, are in press.

Recording of industrial absenteeism: Considerable progress has been made with regard to the recognition by industry of the importance of knowing where, when, and under what conditions absenteeism is occurring. Efforts in this connection are continuing.

Compensation for industrial injuries: A form for the reporting of compensation cases by cause and time of first payment was constructed.

Statistical methods.—Five papers describing time-saving methods of using punch-card material have been prepared. Another paper on the coding and tabulation of medical research data is in press. A slide rule has been made to expedite certain calculations.

CONSULTATION SERVICES

Early in January 1941, the Subcommittee on Industrial Health and Medicine of the Health and Medical Committee, Office of the Coordinator of Health, Welfare, and Related Defense Activities, designated the Division of Industrial Hygiene as the coordinating agency for all national defense industrial hygiene activities. This has necessitated the merging of consultation services to State and local health departments with the defense program of the Division. Accordingly, a conference of State and local industrial hygiene units and the Subcommittee on Industrial Health and Medicine, with the Division of Industrial Hygiene, was called in February 1941. The Fourth Annual Meeting of the National Conference of Governmental Industrial Hygienists was held simultaneously.

The Conference unanimously adopted the following four-point industrial hygiene defense program: (1) Training of industrial hygiene personnel; (2) services to Government industrial establishments, such as arsenals and Navy yards; (3) field and laboratory investigations; (4) assistance to State industrial hygiene units in their programs for

(a) investigation and control of hazards; (b) advice on plant construction and renovation in the interest of health and safety; (c) promotion of health examinations and medical care; (d) education; (e) promotion of adult hygiene programs.

With additional funds made available by Congress, it has been possible to employ more personnel, so that at the end of the fiscal year there were approximately 106 persons in the Division engaged in this work.

Professional personnel have been recruited and trained, both for the activities of the Division and for State industrial hygiene units. The training program has been coordinated with that of the States Relations Division as part of the orientation course for health and sanitation workers in defense areas.

At the close of the fiscal year, there were 32 States with industrial hygiene divisions and 4 cities with such activities. The personnel employed in these units numbered approximately 175 professional and 75 clerical workers. During the fiscal year 1940-41, the total amount from all sources budgeted for industrial hygiene activities in these States and cities was approximately \$800,000. About two-thirds of this sum was derived from Federal grants-in-aid under Title VI of the Social Security Act.

Personnel recruited and trained by the Division of Industrial Hygiene have already been assigned for an indefinite period to aid seven State health departments, while additional personnel will be assigned at the beginning of the new fiscal year to five more States. New personnel have been assigned to those States which are unable to cope with the increased problems in industrial hygiene resulting from the defense effort, and to States which have not had an industrial hygiene program but are now faced with the urgent task of providing one.

The State industrial hygiene programs have been concentrated on furnishing services to defense industries in cooperation with this Division, which guides State activities to a considerable extent.

During March, April, and May 1941, reports were received from approximately 16 States, showing that consultation services have been given to 527 plants employing 311,084 workers. Of this number, 499 plants employing 126,663 workers were surveyed; and detailed studies were made in 163 plants employing 138,430 workers. As a result of these investigations, 1,764 recommendations were made, approximately 400 of which have been complied with in the plants concerned. The industries investigated include production of aircraft, military vehicles, munitions, and ships. It is safe to assume that as a direct result of this work conditions of employment for more than 300,000 workers in defense industries definitely have been improved.

One of the most important activities in the defense program has been assistance to the War Department. At the request of the Surgeon General of the Army, the Division of Industrial Hygiene is now conducting systematic investigations of all industrial establishments of the War Department. Four mobile units, each consisting of a physician, an engineer, and a chemist, are investigating health conditions in arsenals, Air Corps stations, and Quartermaster Corps depots. Already 11 out of 30 establishments certified for study have been investigated, and specific recommendations for improving work-

ing conditions have been made. The Division also has furnished consultation services on dermatology and industrial nursing to War Department establishments and to the States.

During the past year there has been added to the staff of the Division a public health nursing consultant in industrial hygiene, whose main function is to promote public health nursing in industry through the district consultant nurses of the Public Health Service and the State nursing bureaus. Already seven State health departments have appointed public health nurses for special work in industrial hygiene. At present, a survey is in progress to determine nursing activities in industry, from which it is hoped standard practices for such services may be developed.

As in the past, the entire resources and facilities of the Division have been at the disposal of the State industrial hygiene units. Such services have been on the increase and have included: Analyses of industrial dusts, determinations of minute amounts of metals in body fluids, advice on statistical problems, collection and analysis of morbidity reports, development and interpretation of chest X-ray films, examination of pathologic specimens, and training of personnel. In addition, consultation services on administrative and technical subjects were given during the past year to all of the State units. Educational material is also being furnished to the States, to industry, to labor, and to other agencies concerned with industrial hygiene. Popular pamphlets for the health education of industrial workers have been prepared and widely disseminated.

Further advances may be recorded among the States in the control of many health hazards and in the bringing of additional services to the working population through the integration of the industrial hygiene program with other basic public health services.

DIVISION OF INFECTIOUS DISEASES

Senior Surgeon R. E. DYER in charge

RICKETTSIAL DISEASES

Investigations of the rickettsioses present in the United States were continued at the National Institute of Health. The temporary field laboratory in operation in Albany, Ga., during the past year was transferred to Savannah in order to render more effective assistance in rat control work being carried on in that city and to utilize better the material made available through this work.

Rocky Mountain spotted fever.—The incidence of this disease and its geographical distribution have remained about the same as in immediately preceding years. A careful study of cases of the disease and a comparison of strains of rickettsiae isolated in laboratory animals have shown that, contrary to the popular conception, there is little difference in the severity of the disease in the eastern part of the United States in comparison to the Northwestern States where the disease has long been thought to be excessively virulent.

The hyperimmune rabbit serum developed for the treatment of spotted fever has been used on a study basis on several cases of the disease. The present indications are that this serum is a valuable therapeutic agent. This is especially pleasing since this is the first

therapeutic agent which has shown definite value in treating cases of Rocky Mountain spotted fever.

Typhus.—This disease still shows a tendency to spread northward from its area of greatest prevalence, the Southern States. Cases were recognized for the first time in two cities in Ohio and one in Missouri. In addition, cases were recognized in Richmond, Va., and in Washington, D. C. In neither of these cities had typhus definitely appeared before 1940.

Approximately 100 liters of the newly discovered yolk sac typhus vaccine were sent to various countries where typhus is present, Hungary, Rumania, Spain, and China.

"Q" fever.—It was discovered during the year that "Q" fever, a rickettsial disease of recent identification, may produce in man an atypical pneumonia clinically identical with the so-called virus pneumonias which have been reported from various sections in the past few years. Work is being continued to clear up any possible relationship of these "Q" fever pneumonias to the other members of this clinical group.

Complement fixation.—The "Q" fever prevalent in Australia and the American "Q" fever were shown to be immunologically similar by agglutination and by agglutinin absorption tests. These were also shown to be similar by protection afforded by vaccines in guinea pigs and by neutralization tests with hyperimmune serums.

A complement fixation test was developed which was shown to be of value in the identification of "Q" fever and of endemic typhus fever and which differentiated endemic typhus from Rocky Mountain spotted fever. The test was shown to be specific, considering rickettsial diseases as well as a number of other disease conditions. Using as antigen endemic typhus fever rickettsial suspensions, negative results were obtained with serums from cases of tuberculosis, syphilis, leprosy, lymphopathia venereum, malaria, undulant fever, tularemia, and trachoma. The tests for both "Q" fever and endemic typhus were of a high degree of sensitivity. The test for "Q" fever detected the disease in apparent infections and the test for endemic typhus showed fixation of complement as early as 7 to 8 days after the beginning of fever and as late as 9 years after illness.

Rickettsial infections and vaccines.—New foci of Rocky Mountain spotted fever have been reported in 62 counties in 18 States. Tobia petechial fever of Colombia has been shown to be immunologically identical with Rocky Mountain spotted fever, and South African tick-bite fever to be closely related to boutonneuse fever.

Rickettsial vaccines have been distributed as follows: Rocky Mountain spotted fever, 638 liters (122 more than in 1940); epidemic typhus, 179 liters (mostly to Spain and China for test use); and Tobia fever vaccine, 0.5 liter. Polyvalent rickettsial vaccines are being used experimentally for the immunization of laboratory personnel.

St. Louis encephalitis.—Horses are susceptible to this virus inoculated intracerebrally. The clinical disease is indistinguishable from western equine encephalomyelitis. Incident to a Colorado encephalitis epidemic in the fall of 1940, antibodies for this virus were demonstrated in both human and equine serums.

Tularemia.—Standard chlorination treatment for water supplies is effective in killing *Bact. tularensis*. The urine of *tularensis*-inoculated frogs is apparently infectious.

Studies of Ornithodoros ticks and disease transmission.—*Ornithodoros parkeri* has been proved a vector of relapsing fever. This disease has been reported from Oregon for the first time and *O. hermsi* found to be the transmitting agent. Spirochetes have been recovered from *O. parkeri* found in Utah and from *O. turicata* taken in New Mexico. The known range of *parkeri* has been extended to include Idaho and eastern Colorado, that of *turicata* to Utah, and *talaje* to Kansas. A new bat-infesting species, *O. kelleyi*, infests houses in northern States.

Yellow fever.—A new laboratory has been equipped for the manufacture of yellow fever vaccine. A vaccine prepared without human serum has been developed and is to be tested experimentally.

Parasitology.—Biologic and taxonomic studies of bloodsucking parasites have been continued. An index to the literature of the North American Siphonaptera and a monograph of the argasid ticks of North America have been completed. Six new species of ticks have been described.

Microbiology of ticks.—A study has been initiated to determine what pathogens occur spontaneously in native ticks and to obtain such other knowledge of the microbiology of ticks as is pertinent in testing them for infectious agents.

Miscellaneous.—Serologic and other diagnostic tests for physicians, determinations of parasites, and other routine services have been rendered as usual.

VIRUS DISEASES

Poliomyelitis.—Work with the Lansing strain of poliomyelitis has been continued. Approximately 1,000 neutralization tests on human serums have been carried out with a view of determining the distribution of immunity to this strain of poliomyelitis in the general population and in groups showing maximum and minimum degrees of exposure to the general population.

Choriomeningitis.—Work on choriomeningitis virus has been continued. Additional evidence pointing to the house mouse as the effective reservoir for the virus has been secured. One case of the nonmeningeal type of the disease was identified.

New virus.—An apparently previously unrecognized virus was isolated from a case of aseptic meningitis from Gallinger Municipal Hospital. The properties of the virus are being studied.

Influenza.—About 200 chemical compounds were tested for therapeutic action against experimental influenza in mice. This work is still in progress. The histopathology of type B influenza (Lee strain) was studied in mice and found to be quite similar to that of type A. An epidemic of influenza was studied in Puerto Rico and unsuccessful attempts were made to isolate virus strains by ferret inoculation. An epidemic of influenza in southern California was studied in December; antibody titrations were made of serums from patients both in California and in Washington, D. C., which indicated that the 1940-41 epidemic was due to type A influenza virus.

Lymphogranuloma venereum.—The histopathology of this disease was studied in mouse lung. Chemotherapeutic studies were made with

various compounds; several were found to be effective. The intranasal inoculation of the virus was found to be better for such studies than intracranial inoculation because the controls can be regularly killed by the former method. A probable case of accidental infection of the eye with this virus occurred in a laboratory worker. The virus was isolated by mouse inoculation and cure was apparently obtained by chemotherapy.

Mouse pneumonia virus.—A virus was encountered, probably originating in stock mice, which causes pneumonia consolidation in mice and is apparently the same as a virus described in 1940 by Horsfall and Hahn. The histopathology of the disease was studied.

PNEUMONIA

The investigation on pneumonia this year has been for the most part a continuation of studies, first, of the antigenic polysaccharide of pneumococci both in human beings and in experimental animals in view of discovery of a rational prophylactic procedure in this disease; and second, of the synthesis of organic compounds and of tests to determine their chemotherapeutic activity against pneumococcus, *Streptococcus hemolyticus*, and influenza virus.

Antigen.—Observations in this as in previous years have shown that pneumococcus polysaccharide or whole-cell vaccine stimulates antibody in only approximately 95 percent of human beings injected; in other words, 5 percent of the general population have no serum antibody either before or after injection. The serums from different individuals who do respond vary widely in antibody titer. This great variation in response of human beings suggests the possibility that there may be correlation with the degree of susceptibility to pneumococcus infection. For that reason, attempts have been made to transfer the investigation to mice. The mouse study so far has revealed the fact that by the use of an appropriate dose of polysaccharide antigen the immunologic system in this animal is so altered that subsequent injection of an antigenic dose is not followed by an increased resistance to pneumococcus infection. This, which might be called an immunologically paralyzed state, continues for at least one-third the expected duration of the life of a mouse, the longest time so far tested. A similar paralyzing effect was observed when whole-cell vaccine was used.

Field study with antigen.—Two methods of approach have been followed to determine whether or not individuals who fail to respond to pneumococcus antigen are more susceptible to pneumonia. First, the immunological response to antigen has been studied in individuals who have had lobar pneumonia within the past 2 years. Although observations were made on a relatively small group (56), over 50 percent were considered poor reactors and none had very high titer of serum antibody following injection of antigen. Second, a large sample of the population has been injected and skin-tested, and the incidence of pneumonia has been observed in the two groups, the one having negative, and the other having positive skin reactions. The latter indicates the presence of serum antibody. In all, about 30,000 individuals were injected. Analysis of these results has not yet been completed.

Chemotherapy.—Some compounds have been synthesized which have definite activity in mice against pneumococcus infection; but with the exception of the condensation products of glucose with sulfapyridine and with sulfathiazole, none has been discovered which was promising except as a lead for further study. The glucose-sulfapyridine and glucose-sulfathiazole condensation products are water-soluble and have been found to be less toxic in mice than the parent substance when administered orally. Since the coupling is made through the amine group, which is essential to therapeutic activity, it is not surprising that this activity is not observed when the chemical is injected subcutaneously, intravenously, or intraperitoneally. But by the oral route, the condensation product is readily hydrolyzed in the stomach with resultant full therapeutic action. Against *Streptococcus hemolyticus*, one compound has been made which is water-soluble, and in mice is at least as active as sulfanilamide and much less toxic.

Clinical study.—Because of their lower toxicity in mice, the above-mentioned glucose compounds were given a preliminary trial in patients with lobar pneumonia, to determine whether such compounds are less toxic than the parent substance in man. Sixty-one cases were treated with glucose-sulfapyridine with the result that therapeutic activity was as good as with the original substance, but the number of individuals suffering untoward reactions such as vomiting, nausea and vomiting, neuritis, kidney stones, agranulocytosis, etc., was also the same as with sulfapyridine alone. It would thus appear that there is no advantage in using glucose-sulfapyridine over the parent substance. Only 12 cases were treated with glucose-sulfathiazole; and although no untoward reactions followed its use in this group, it will be necessary to continue the study before definite conclusions are warranted in regard to its relative toxicity as compared to sulfathiazole alone.

HEART DISEASE

Clinical and pathological studies of patients with rheumatic fever have been continued. A cytotoxic serum specific for human hearts has been made by injecting rabbits with a finely ground suspension of the organ absorbed on aluminum gel and combined with staphylococcus toxin. A study of the properties of this serum is in progress.

Reports in the English literature of German measles apparently inducing carditis and arthritis or actual rheumatic fever have suggested a study of this contagious disease and its possible relationship to heart disease. Patients of the recent local epidemic (Washington, D. C.) have been examined clinically for joint and heart involvement and specimens of their blood collected for serologic investigation.

MALARIA

National defense activities.—In response to requests, a series of training courses in blood film diagnosis of malaria was given to Army technicians. Assistance was given in training Public Health Service technical personnel for health work in defense areas. A survey was made for the Army to plan malaria control at a military base in the Caribbean. Assistance was given various State health officials in

carrying out malaria and mosquito control in defense areas. Investigations on phenol larvicide were conducted, and a report submitted for publication, indicating that this type of larvicide was less suitable than kerosene. Studies of means of protecting troops from mosquito bites were begun.

Parasitology and immunology.—Oral transmission of malaria (*Plasmodium relictum*) in pigeons was accomplished and attempts were begun to produce similar results with human malaria. These studies offer interesting possibilities from the standpoint of immunology and malaria therapy. Studies on immunity to malaria (*P. cynomolgi*) in monkeys, and on production of sterile living mosquitoes were in progress.

Biological studies.—Investigations aimed at developing methods of mosquito control based on "naturalistic" factors were carried out. A protracted study on the importance of *Anopheles walkeri* was being brought to a close.

Engineering studies.—A report was prepared showing the durability of concrete ditch linings under observation for some 5 years.

Miscellaneous.—Technical assistance was given to State and other health authorities in response to requests. A survey of malaria along the upper Mississippi Valley was carried out and is still in progress. Six papers on various aspects of malaria were contributed to a symposium organized by the National Malaria Committee.

TUBERCULOSIS

Field studies.—Comparative studies of household attack rates in rural areas of Tennessee and south Alabama have resulted in the interesting finding that tuberculosis tends to spread less within the households of a tuberculous individual in south Alabama than in Tennessee. This may partially account for already observed differences in mortality from tuberculosis in those areas.

A study of the relationship of pulmonary calcification to tuberculosis in a series of 44 households containing 279 present members in an Ohio county has shown that there was no relationship apparent between this pulmonary calcification and tuberculosis.

Epidemiological studies of the extent and causes of the high tuberculosis incidence and mortality in middle Tennessee and Kentucky as compared with the southern Coastal Plain were continued.

Environmental studies.—Analysis of economic, dietary, and environmental data collected by house-to-house canvass in the contrasting regions was continued with elaboration and confirmation of preliminary findings that these factors do not account for the regional distribution of tuberculosis mortality. Chemical analysis of foods locally produced in the two regions was continued and is building conclusive evidence of the previously indicated high calcium and phosphorus content of foods grown in the high rate region. Radiation studies were continued at the two stations, and problems of instrumentation and standardization were so clarified as to prepare for a large scale study.

X-ray studies.—Surveys by families in west Tennessee and southeastern Missouri covering 4,000 persons were conducted in continuing the study of the prevalence and family incidence of pulmonary calcifications.

Development of a technique for making chest roentgenograms by 35 mm. fluorography with 30 milliamperere portable X-ray equipment was completed, and constitutes the first successful adaptation of such equipment to this purpose. By making two exposures at different tube levels on each patient, interpretations comparing favorably with those from a single conventional film were obtained at one-fiftieth the cost per patient.

Attack rate studies.—A comparison of the effect of household association with cases of open tuberculosis on persons in the two regions indicates that the risk of attack is definitely greater, especially among children, in the high rate region.

Laboratory studies.—The investigation of the possible role of strains of tubercle bacilli to observed variations in the epidemiology and mortality from tuberculosis in the southern United States is being continued. Variation in the characteristics of the strains isolated in the study areas has been observed but their significance awaits further study.

Critical studies on the virulence of tubercle bacilli for various hosts have been initiated.

The following conclusions appear warranted regarding the possible role of silica in the *in vitro* growth of the tubercle bacillus. If silica is an essential growth element, the limiting requirement probably does not exceed 5 parts per million. This figure is generally exceeded in autoclaved liquid media; in fact, the silica content of Long's medium may reach the high value of 50 to 100 parts per million on incubation in flasks of "resistant" glass for 2 or 3 months at 37° C. In the general absence of definite statements regarding the observance of suitable precautions, considerable doubt may be expressed as to the validity of published claims concerning the effect of silica on the *in vitro* growth of the tubercle bacillus.

The silica content of Long's medium may be conveniently reduced to 1 or 2 parts per million by using Berkefeld filtration instead of autoclaving and this level of silica content may be maintained during incubation through the use of paraffin-coated flasks. Scanty growth of the tubercle bacillus was obtained under these conditions even when the incubation period extended to 8 or 9 months. The results, however, must be accepted with caution owing to the as yet undetermined influence of such factors as the presence of paraffin and also to inevitable discontinuities in graded series of observations conducted over prolonged periods of incubation.

Attempts to prepare a medium containing less than 1 part per million of silica were not fruitful; collecting or precipitating agents such as magnesium oxide were used; filtration through columns of adsorbent materials was also tried.

Tuberculous meningitis has been observed in a number of guinea pigs as the result of intraperitoneal injection of a strain of human tubercle bacillus. The animals have developed clinical symptoms indicating central nervous system involvement. In the majority of instances examination of these animals has revealed no gross pathology of the organs of the abdominal cavity.

MEDICAL MYCOLOGY

Ultraviolet radiation.—In cooperation with the Division of Industrial Hygiene studies of the effects of monochromatic ultraviolet upon

dermatophytes have been continued. Exposure to appropriate chemicals after irradiation stimulates recovery and induces mutations in the test fungus. Long ultraviolet is effective in producing mutations. Under the conditions maintained, ultraviolet radiation was not effective in the prophylaxis or therapy of experimental dermatophytosis in guinea pigs.

Coccidioidomycosis.—Previous studies by Dr. J. D. Aronson of the Indian Service having indicated that there are areas in Arizona where coccidioidomycosis is probably endemic, attempts have been made, in cooperation with the Indian Service, to determine the frequency and severity of infections and to isolate the fungus from soil. The study is still in progress. A search for coccidioides was also made in an institution in Xenia, Ohio.

Pulmonary mycosis.—In connection with the tuberculosis studies of this Division the search for pulmonary mycoses has been continued.

Antigens.—Skin-testing antigens have been prepared from certain fungi which were suspected of being pathogenic.

Mycotic endocarditis.—Two additional strains of fungi from mycotic endocarditis have been studied and compared with strains previously isolated. In connection with one of the cases, which is being reported, an attempt was made to isolate the fungus from samples of heroin, the patient having been a heroin addict.

Fungicides.—Tests of a floor material alleged to be fungicidal showed that it was of no value as a fungicide.

Miscellaneous.—Besides those received in the special investigations mentioned above, 145 cultures of fungi or specimens were received from various sources for study and identification of the fungi isolated.

DENTAL STUDIES

The study of the relation of the mineral composition of domestic water supplies to the amount of dental caries continued. Field observations limited to 12- to 14-year-old white children with continuity of exposure to the variable under investigation (domestic water supply) were largely completed during the year. Including observations previously reported the study now covers a total of 8,100 children of 24 cities in 6 States. The fluoride content of the water supplies studied ranged from 0.0 to more than 2.5 parts per million; the total hardness from 27 to 445 parts per million. No relationship between the total hardness and the amount of dental caries was observed.

The negative correlation between fluoride in the water supply and the amount of dental caries is apparently quantitative between 0.0 and 1.0 part per million and largely qualitative thereafter. The dental caries inhibitory factor, presumably fluoride, was operative at such low concentrations (e. g., 1. 2 p. p. m. of fluoride at Aurora, Ill.) that mottled enamel as an esthetic problem was not encountered.

Fluorine was found to be a normal constituent of human saliva at a level of about 0.10 p. p. m. The analytical data failed to show conclusively any relation between fluorine in drinking water and the resulting fluorine excretion in human saliva.

No apparent change in dental caries activity, as measured by *L. acidolphus* counts, was observed in a group of 109 public school children whose domestic water supply was increased in fluoride content

from 0.1 to 0.7 parts per million. The group, however, has been under observation for only 1 year; this study is continuing.

Collaborative studies with the Division of Chemotherapy and the Division of Chemistry showed that a minimum of 10 p. p. m. of fluorine as sodium fluoride in drinking water gave partial protection against occlusal rat caries. Approximately 80 percent protection resulted from 50 p. p. m. and 100 p. p. m. fluorine in drinking water. Fluorine equaling 125 p. p. m. in food gave practically complete protection against occlusal rat caries. The subcutaneous injection of fluoride caused no significant reduction in induced rat caries. These results suggest that fluorine acts to inhibit rat caries by anti-enzymatic local action within the oral cavity.

The pooled molar teeth of groups of carious rats were not different from noncarious rats in content of ash, calcium, and phosphorus, and in fluorine deposited post-eruptively.

LEPROSY

Studies of the relation of nutrition to rat leprosy have been continued from previous years. Additional deficiencies have been found to render the rat more susceptible to the infection. There appears to be a correlation between the type of deficiency and the organ most involved.

Attempts have been made to discover an animal more susceptible to leprosy than the white rat. The cotton rat was found to be much less susceptible than the white rat, while the hamster has been found to be definitely more susceptible to one of the strains of rat leprosy employed in the investigations.

In Hawaii.—Activities at the United States Leprosy Investigation Station in Honolulu consisted in studies of different problems of leprosy and the medical care of patients in the adjoining territorial receiving hospital.

Comparative studies of the relationship of the sedimentation rate to the Kolmer, Kahn, and Eagle (precipitation) tests demonstrated that the blood of leprosy patients gave over twice as many positive reactions for each of the syphilitic tests when the sedimentation rate was over 50 mm. per hour than when the rate was less than 25 mm. The Eagle test gave the smallest number of positive reactions.

This year, tests were made of the therapeutic effects on rat leprosy of the toxoids of tetanus and diphtheria, and also other substances, all of which failed to show any appreciable results on the course of the rodent disease.

In April, 11 patients with active, bacteriologically positive leprosy began the widely published diphtheria toxoid treatment of leprosy and others have been added from week to week. Most of them have received 4 to 6 subcutaneous injections with no apparent effect on the clinical course of the disease. Three patients developed rather severe leprosy reactions while under treatment.

OTHER INVESTIGATIONS

Mumps.—Efforts have been directed towards establishing the virus in laboratory animals. Various types of material from human cases have been used. Inoculation of saliva collected early in illness has resulted in the production in monkeys of a clinical condition similar

to, but not identical with, that previously described as, and proven to be, mumps. The parotitis produced is histologically like that described by others. However, passage has been accomplished only through a maximum of five monkey transfers.

Injection of human and monkey passage material into numerous other species of animals, by various routes of inoculation, has not produced any definite clinical syndrome in them.

Pertussis.—It has been found that nicotinic acid is essential for the growth of *H. pertussis*. Various antigens of *H. pertussis* are being isolated and purified in order to discover which are essential in producing immunity. Work is being continued on a test for susceptibility to pertussis.

Rubeola.—Measles has been produced in monkeys and attempts are being made to grow the virus in the chick embryo. Pathologic studies are in progress for the purpose of identifying the virus in small animals.

Rubella.—A clinical syndrome characterized by fever, leukopenia, lymphocytosis, and rash has been produced in monkeys by means of blood and nasal washings taken from active cases of German measles.

Trachoma.—In collaboration with the Arkansas State Board of Health, tests were made to determine the value of sodium sulfanilate in the treatment of trachoma. It was found useful in the treatment of elderly patients and of those who could not tolerate sulfanilamide. Sulfanilic acid solution was also found to be of considerable value as a local therapeutic agent.

The gonococcus and gonococcal infections.—Studies in progress on the biology of the gonococcus include investigations of the virulence of freshly isolated strains for mice, the use of tissue cultures for increasing the virulence for animals, and the relation of the biochemical nature to serologic types.

Hemolytic streptococci.—Studies were continued on the classification of beta hemolytic streptococci of Group A, using carbohydrate fermentation, sensitivity to bacteriophage, and agglutination tests. Cross protection between serologic types was also studied. Strains, belonging to several types, were found capable of producing antiserum in rabbits which would protect mice inoculated with strains of heterologous types.

Chagas' disease.—Experimental work indicates that a blood-sucking insect, *Triatoma sanguisuga ambigua*, which is widely distributed in Florida, is capable of transmitting *Trypanosoma cruzi* to guinea pigs, but none of 300 live bugs examined was found naturally infected. Agglutinins for *Trypanosoma cruzi* were produced in experimental animals.

Weil's disease.—It was shown that young white mice (*Mus musculus*) are extremely susceptible to infections with *Leptospira icterohaemorrhagiae* and are the animals of choice for laboratory use. A mouse-protection test based upon the presence of protective antibodies in serums of patients suffering from or recovered from Weil's disease has been developed.

Fifty-two cases of Weil's disease have been diagnosed by agglutination and mouse-protection tests. Cases occurred in Puerto Rico, Wisconsin, California, Ohio, Pennsylvania, Virginia, Maryland, Georgia, Massachusetts, Connecticut, New Jersey, Alabama, Michi-

gan, and the District of Columbia. Seven of the cases were inapparent infections.

Leptospirosis was detected in dogs in North Carolina and Maryland, and among wild rats in Virginia, Wisconsin, and the District of Columbia.

Rat-bite fever.—Three cases of rat-bite fever were reported from the District of Columbia. One was caused by *Spirillum minus* and two by *Streptobacillus moniliformis*. Diagnostic aid was given in cases originating in Virginia, South Carolina, Pennsylvania, and Massachusetts.

Tularemia.—In 1940, a total of 1,616 cases of tularemia was reported from 42 States and the District of Columbia as compared with a total of 2,291 cases in 1939.

Enteric infections.—The broad plan of the study of the enteric infections has been to obtain comparable observations in four areas with low, moderate, high, and very high reported mortality from the diarrheal diseases. In early 1939, the studies were terminated in New Mexico, the area with high mortality. During the present year the field observations have been completed in Georgia, with moderate, and New York, with very low mortality. The investigation as planned entered its final phase, with the initiation of studies in Puerto Rico.

During the fiscal year much time has been given to the analysis of the data already accumulated.

The introduction of sulfanilyl-guanidine presented a new field for observation. Studies of the influence of this agent on *Shigella* infection were initiated immediately and are progressing satisfactorily.

NATIONAL CANCER INSTITUTE

Pharmacologist Director CARL VOEGTLIN in charge

NATIONAL ADVISORY CANCER COUNCIL

The National Advisory Cancer Council met four times. Thirty-three applications for grants-in-aid were considered, and 15 were recommended.

University of California: \$16,770, treatment of cancer by the use of fast neutrons produced by the cyclotron; \$9,750, effect of fast neutrons on cancer in human beings; \$600, urinary gonadotropic hormone coincident with testicular neoplasms.

Louisiana State University: \$500, photographic and art work in connection with cancer research.

University of Cincinnati: \$2,400, to improve the present methods of diagnosis and treatment of cancer; \$7,796, gastric carcinoma and its relationship to chronic atrophic gastritis.

Chicago Tumor Institute: \$16,800, radiotherapy of radioresistant forms of cancer of the mouth, pharynx, and larynx.

National Research Council: \$1,000, assistance in the maintenance and progress of the American Registry of Pathology.

Meharry Medical College: \$1,100, further development, research, and maintenance of Tumor Clinic of George W. Hubbard Hospital.

Jackson Memorial Laboratory: \$15,000, research in genetics of cancer in cooperation with National Cancer Institute.

Barnard Free Skin and Cancer Hospital: \$5,000, integration of changes in experimental carcinogenesis.

Cornell University: \$2,700, a quantitative study, by *in vitro* methods, of the general nitrogen metabolism of the "butter yellow" liver tumor of the rat.

Memorial Hospital: \$5,000, metabolic studies on patients with gastric cancer.

Society of the New York Hospital: \$5,000, researches in the early diagnosis of gastric cancer; the comparative value of clinical methods.

University of Rochester: \$5,000, study of gastric cancer.

Twelve grants totaling \$77,870 were paid. The terms of two Council members expired, Dr. James B. Conant and Dr. Arthur H. Compton. Dr. Cornelius P. Rhoads and Dr. Edward A. Doisy were appointed to fill these vacancies. The committee on cooperation in cancer research has concentrated its efforts on gastric cancer. A 2-day conference on this subject, in which some 50 scientists participated, was held in October. Plans for a coordinated program of gastric cancer research in three institutions were completed.

EXPERIMENTAL PRODUCTION OF CANCER

Interstitial cell tumors of the testis were induced in strains A and C mice by stilbestrol pellets. This treatment also caused pituitary adenomas in C57 Black mice, and hastened the appearance of lymphatic tumors in C mice. Hemangiomas were produced in C mice by 2-amino-5-azotoluene. This is the first record of the production of this type of tumor by a chemical, which also is known to induce tumors of the lung and liver.

The study of lung tumors has shown that the actual amount of methylcholanthrene impinging in the lungs determines the neoplastic reaction. Tumor production in this case is due to a local tissue reaction rather than to a systemic effect. The pulmonary reaction is more pronounced in young than in old mice, and is not influenced by foster nursing, by reticulo-endothelial blockade, and is the same whether the carcinogen is given in a single or in repeated injections.

Prolonged treatment of mice with desoxycorticosterone, a hormone of the adrenal cortex, did not accelerate the appearance of mammary carcinoma in C₃H mice.

A comprehensive study of the production of tumors in mice by ultraviolet light has shown that this depends on the relation of dosage and intensity and occurs most constantly in the hairless external ear. Short-term exposure results in an inflammatory reaction followed by fibrosis and return to a normal state. With continued exposure the majority of tumors have been sarcomas, which was explained by the discovery of a higher transmission of ultraviolet radiation through mouse than human skin. A number of sarcomas of the eye, apparently arising in the cornea, have occurred following small dosages of radiation. An instrument for measuring the response of human skin is practically completed.

In studying the action of X-rays in breaking down the resistance of inbred mice to the development of leukemia it was found that (1) resistant animals are rendered susceptible by whole body exposure to 400 r, and that (2) the same dosage is effective whether applied to the anterior, middle, or posterior thirds of the body. This action of X-rays, therefore, is not confined to any particular tissue of the body.

Work with several strains of guinea pigs showed that subcutaneous injections of methylcholanthrene caused fibrosarcomas, liposarcomas, and tumors containing cartilage or bone. Furthermore, pronounced differences in response to methylcholanthrene were noted in the different strains. Genetic constitution, therefore, is a factor in carcinogenesis in guinea pigs.

Continuing the studies on lung cancer, it was found that benzene extracts of air dust collected at Boston, Pittsburgh, and the exhaust of the New York Holland Tunnel produced sarcomas in mice at the site of subcutaneous injection. A ton of dust was collected from the exhaust air of the Holland Tunnel and is being extracted and fractionated for the purpose of isolating the cancer-producing chemicals therein.

In order to determine whether tobacco smoke can produce lung cancer in inbred mice, a complex apparatus has been designed and is being used for the prolonged exposure of animals to the smoke under well-controlled conditions.

Further attempts have been made aiming at the production of true carcinoma of the stomach and at least two such tumors have been obtained recently in mice following the intramucosal injection of methylcholanthrene. On the other hand, feeding of various emulsions of hydrocarbons has only caused squamous-cell carcinomas of the forestomach. This indicates that gastric mucin protects the glandular mucosa. A careful study of the histogenesis and histopathology of the squamous-cell cancers was made.

Claims in the literature that heated dietary fats are a cause of gastric carcinoma have been submitted to a systematic reinvestigation. It was found that profound chemical changes occur on subjecting edible fats to temperatures above 300° C. Such heated fats were incorporated into the diet of rats, but so far, after prolonged feeding, no tumors have occurred. Fractions of heated fats were also prepared and were fed. Cholestadiene, a product which on theoretical grounds might be formed in heated fat, was prepared and tested for its carcinogenic action. Desoxycholic acid from bile is also being tested for its tumor-producing properties if incorporated in the diet. Animals fed on heated fats do not consume much food and therefore the effect of total starvation on the gastric mucosa was studied in rats. Epithelial hyperplasia and papillomas of the forestomach developed. These lesions, contrary to claims in the literature, cannot be prevented by adding choline to the diet.

More than 100 mice with chemically induced adenocarcinomas of the small intestine were used for the completion of a detailed study of the histogenesis of this tumor.

Genetic studies have revealed the fact that the susceptibility of hybrids to different types of tumors cannot be predicted from the known susceptibility of their parent strains. Hybridization may produce offspring which are more or less susceptible than the parent stocks. Further work on the inheritance of lung tumors has shown that instead of susceptibility being due to a single qualitative gene comparable with a coat color gene, the degree of susceptibility is controlled by a number of genes, which are quantitative in nature and more comparable with such genes as those controlling size.

The influence of foster nursing on the incidence of tumors was continued with the main objective to determine the nature of the

agent in mother's milk which is responsible for the occurrence of mammary tumors. Evidence was obtained indicating that the milk influence was transmitted to the second generation of resistant mice, though the second generation was not foster-nursed. Evidently the milk factor is capable of self-propagation. Additional experiments indicated that this factor, if a virus, is not transmitted through contact or *in utero*. A milking machine for mice was designed and has been used for securing sufficient milk for fractionation with the ultracentrifuge. These fractions are being tested in susceptible mice for cancer-producing properties. Foster nursing of mice with a high incidence of mammary carcinoma by mice with a low incidence reduced markedly their susceptibility to induction of this tumor with estrogen. Foster nursing of mice with a low incidence of breast cancer by mice with a high incidence increased their mammary tumor induction with estrogen. Hence it seems that estrogens merely prepare a suitable substratum in the breast tissue for the action of a factor transmitted in the mother's milk. Furthermore, it was found that foster nursing exerts no influence upon the induction of testicular tumors with estrogens, nor upon the induction of pulmonary tumors with methylcholanthrene. The vaginal response to estrone is not altered by foster nursing.

Dose-response data, obtained with carcinogenic hydrocarbons in mice, were found to be susceptible to quantitative statistical analysis.

Continued study of liver cancers showed that there is a striking sex difference in susceptibility of mice to induced hepatomas. In rats receiving butter yellow with the diet, hepatomas were induced, which on careful histological study were shown to be of liver cell origin. Rats failed to gain weight, an effect which could be overcome by incorporation of l-cystine or methionine into the diet. This indicates that butter yellow produces a specific demand of the sulfur-containing amino acids for detoxication as a result of which the synthesis of new tissue protein becomes limited.

An observation of fundamental interest was made in a continued research of the reaction of mice to methylcholanthrene. Mice fed on a diet low in cystine showed a low incidence of induced leukemia, but exhibited extensive arteriosclerotic lesions, whereas mice fed on a diet supplemented with cystine showed a leukemia incidence of 90 percent. This is probably the first instance demonstrating that a single dietary factor may influence the production of two widely different pathologic states by a single agent. A study was completed of the leukemic cells in cultures, which showed that the locomotion of these cells resembled that of normal myeloblasts.

Chemical synthesis comprised the preparation of considerable amounts of carcinogenic and noncarcinogenic hydrocarbons for biologic studies. New methods for the synthesis of phenanthrene derivatives were developed in collaboration with two other laboratories.

Further progress was made in the research on the mode of action of cancer-producing agents on small organisms. The evidence indicates that long continued exposure leads to delayed functional changes, which persist for several generations, suggesting that the genetic mechanism of the cells has been affected. The changes were quantitative in nature and were not accompanied by morphologic alterations.

PROPERTIES OF CANCEROUS TISSUES

Much effort was directed toward the solution of the fundamental question: Why does cancerous tissue differ from normal tissue? Since histologic and cytologic methods have not furnished the answer the problem was attacked from the biochemical viewpoint. A beginning was made by the preparation and characterization of the nucleoprotein fraction of the Jensen rat sarcoma and the melanin-containing pseudoglobulin of a malignant mouse melanoma. The cathepsin of the Jensen sarcoma was studied in the Tiselius apparatus and showed only one boundary at pH 4, indicating a fairly homogeneous product. In order to learn more concerning the factors involved in the synthesis of cell proteins the simultaneous effect of activators on the proteinase and peptidase activities on a protein substrate have been investigated. Using a transplantable hepatoma induced by butter yellow feeding it was feasible to compare the activities of some of the enzymes in these tumors with the activities of the same enzymes in normal, regenerating, and embryonic liver. The following results were obtained: (1) Arginase, xanthine-oxidase, and catalase activities are all much lower in the hepatic tumor than in normal, regenerating, and embryonic liver; (2) the amylase activity is the same in hepatic tumor and normal liver, though the tumor is poor and normal liver is rich in glycogen; (3) an enzyme which depolymerizes nucleic acid was discovered in the blood serum of rodents and the dog, and also seems to occur in tissue extracts and milk; (4) exposure of nucleic acid to ultraviolet light or the action of salts and certain native proteins caused depolymerization, an observation which may have a bearing on the process of mitosis; (5) a yeast growth method for determining biotin (vitamin H, coenzyme R) in biological material has been developed. Hepatic tumors were shown to contain only about one-third the amount of biotin as that of normal or cirrhotic liver; (6) the study of a wide variety of chicken sarcomas showed a metabolism highly characteristic of that of mammalian malignant tumors; (7) working with methylcholanthrene-induced leukemia in mice it was found that the characteristic leukemia metabolism develops suddenly at the time of leukemic-cell infiltration in the various organs and the simultaneous transmissibility of the disease by intravenous inoculation of these tissues into susceptible mice.

The effect of a diet deficient in pantothenic acid was studied on normal mice and mice bearing mammary carcinomas. A paralysis of the hind legs and a dermatosis developed in young and adult animals, symptoms which were completely alleviated by pantothenic acid. The paralysis was explained by myelin degeneration in the nervous system. The cutaneous lesion was shown to be noninflammatory and no evidence of hemorrhagic adrenal necrosis was found. Pantothenic acid deficiency retarded the growth rate of the mammary carcinomas, and tumor growth was accelerated following incorporation of pantothenic acid into the diet.

An ultraviolet microscope for taking still and moving picture photographs of cells was set up and was used for precise studies of cell behavior and structure.

DIAGNOSTIC AND THERAPEUTIC STUDIES

The reliability of a new diagnostic test for cancer was investigated. The test is based on the alleged *d*-peptidase activity of the blood serum of cancer patients. Tests with human as well as animal serums showed that the test was not reliable.

A comprehensive study was made of the agent in *B. prodigiosus* filtrate which apparently has therapeutic properties when injected into patients with osteogenic sarcoma. It was shown that this filtrate produces hemorrhage not only in transplanted but also in primary induced sarcomas. Over 500 liters of the filtrate were fractionated and subjected to analysis in the ultracentrifuge and electrophoresis apparatus. All fractions were assayed with an improved method on several thousand tumor-bearing mice. The activity resides in a high molecular weight fraction. Chemical tests indicated the presence of a polysaccharide and analyses gave results similar to nitrogen-containing polysaccharides obtained from other bacteria. Several patients with bone tumors were treated with this material with results similar to those following injection of "Coley's toxins." Incidentally, it was found that maleic acid also causes hemorrhages in certain tumors, an interesting lead which is being further investigated.

A large number of synthetic chemicals have been tested for therapeutic activity in various types of animal cancers.

A research fellow has supervised the construction of a 60-inch cyclotron for the Carnegie Institution of Washington. This cyclotron will furnish a convenient source of radioactive chemicals for work at the Cancer Institute.

A survey of radiation protection of the personnel in 45 hospitals having received loans of radium from the Institute was completed. Recommendations were made for the improvement of conditions in many of these clinics for the better protection of both personnel and patients. The data are also of value for the protection of personnel exposed to X-rays in defense industries.

A significant observation showed that a very large amount of X-radiation does not stop motility and fertilizability of frog sperm, whereas small amounts will cause extensive abnormalities in later development. Human sperm behaved similarly with regard to motility. Experiments on four types of malignant mouse tumors showed that large amounts of dead tumor tissue killed by X-rays exert no deleterious action on viable cancer cells. Therefore, X-rays act on the tumor bed and directly on tumor cells.

In connection with a study of results in the treatment of cancer, 22,137 case records have been reviewed to date. Final tabulation of data on the cost of treatment of cancer patients was completed.

At the tumor clinic, supported in part by Institute funds, the staff and the number of cancer patients have been increased.

A paper was published calling the attention of the medical profession to the need for early diagnosis of stomach cancer and giving information useful for this purpose.

CANCER CONTROL, RADIUM LOANS, TRAINEES, EDUCATION

Consultation service in cancer control was provided to State organizations. Arizona, New Mexico, Wyoming, Montana, and Idaho have initiated cancer control activities.

Radium loans.—Loans were renewed to 41 hospitals and 3 new loans were made. Approximately 1,934 patients were treated with Government-owned radium. Supervisory visits were made to these hospitals.

Trainees.—Thirty-one trainees in the diagnosis and treatment of cancer were on the pay roll.

Education.—A large number of inquiries for information on facilities for cancer treatment were answered. A popular pamphlet on stomach cancer was prepared for distribution. Exhibits of scientific results were made at meetings of several professional societies.

JOURNAL OF THE NATIONAL CANCER INSTITUTE

The first volume of this Journal was published. It contains 60 reports of scientific contributions to the cancer problem by members of the Institute's staff. Over 1,000 copies were distributed to libraries, research workers, and physicians in the United States, Latin American countries, Canada, and other countries. The Journal already functions as a leading clearing house of knowledge of progress made in the solution of the cancer problem.

MORTALITY, INCIDENCE, AND EPIDEMIOLOGY

In collaboration with the Division of Public Health Methods, further studies on mortality and preliminary data on incidence in 10 localities were completed.

In connection with the epidemiological study 2,393 new patients were added, making a total of 6,664 cases. These data are now ready for analysis.

DIVISION OF PATHOLOGY

Senior Surgeon R. D. LILLIE in charge

The amount of experimental pathologic material studied during the current fiscal year increased somewhat over that of the preceding year. A total of 2,503 animal autopsies was performed.

Studies were made on the pathogenesis and pathology of experimental poliomyelitis in monkeys, mice, and cotton rats; lymphocytic choriomeningitis in mice; influenza in mice; measles in monkeys and chorio-allantoic membrane; mumps in monkeys; pertussis in rats and rabbits; Rocky Mountain spotted fever in man and monkeys; endemic typhus in guinea pigs; psittacosis in birds and mice; neurotropic viruses in mice, including meningopneumonitis; trypanosomiasis in various animals; leptospirosis in mice (*Peromyscus*); leishmaniasis and torulosis in guinea pigs; "Q" fever in man, monkeys, mice, and guinea pigs; lymphopathia venereum in mice; tularemia in various mammals; amebiasis in cats; and ascariasis in rabbits.

The pathology of various dietary deficiencies was studied, including pantothenic acid deficiency in rats and dogs; vitamin C and calcium deficiency in monkeys; vitamin A deficiency in rats; dietary protein deficiency and sulfanilamide toxicology; the effect of various deficient diets on the pathogenesis of tuberculosis and leprosy in rats, hamsters, and guinea pigs; and the role of various dietary deficiencies and alcohol in the etiology and pathogenesis of hepatic cirrhosis. The pathology produced by various toxic substances was studied, including mapharsen, sulfanilamide, selenium, aminoazotoluene and other azo

compounds, fluorine, and picric acid. A number of animals were examined in connection with studies on the etiology of certain tumors of lymph nodes in man. Study of the basic pathology of spontaneous diseases of laboratory animals was continued.

Study of the incidence and possible concurrence of local pathologic alterations with appendiceal oxyuriasis has shown a very high incidence of the infestation in American Indians and Eskimos, and also that pinworm infestation is not related etiologically to appendicitis.

Analysis of human tumors received for diagnosis from 1920 to 1939 has been completed. It showed interesting differences in type incidence between white seamen and other white males. A small series of tumors from Indians also showed interesting differences in type incidence from those in white persons.

Study of the pathology and bacteriology of pulmonary calcification occurring in children in the central Tennessee area, Cincinnati, Ohio, and Lexington and Louisville, Ky., was continued. To date material from 28 suitable cases has been obtained.

The study of the post-mortem pathology of untreated syphilis in Negroes initiated several years ago in cooperation with the Division of Venereal Diseases has been continued. Thirteen autopsies were added during the year, bringing the total to 58.

Studies on the topographic pathology of human poliomyelitis have continued during the year. Five additional brains have been obtained. One of these was the brain from which the "Lansing" strain of virus had been isolated. A paper describing and comparing the pathology in the original human tissue and in monkeys infected with the Lansing strain of virus has been prepared. The pathology of various other strains in monkeys has been studied.

Autopsy material from 6 cases of various infectious diseases was received—2 cases of poliomyelitis, 1 of Weil's disease, 2 of Rocky Mountain spotted fever, and 1 of congenital syphilis.

Technical studies on the effect of pH and buffers in formalin on the stainability of tissues are being continued. One 4-year test is now in its third year. In general, previous indications are confirmed. Examination of certain synthetic resins was made as to their suitability as mounting media for sections stained with thiazin dyes. Studies on oil soluble dyes and their availability as fat stains have been initiated. Extended studies on dyes usable in mordant staining of connective tissue and the mordants are being made.

Studies begun last year in cooperation with the malaria laboratory of the Division of Infectious Diseases on the role of the various thiazin dyes in the staining of malaria parasites have been continued. Dye formulae using eosinates of the various dyes were worked out which closely simulate in their staining action the previously widely used German dye solution of Giemsa type. Further studies have shown close correlation between staining action of polychrome methylene blue eosinates on blood and protozoan parasites and the absorption spectra of the dyes. Considerable progress has been made toward standardization of methods of preparation of polychrome methylene blue so as to enable the production of a more constant product.

During the year, 1,820 surgical specimens and material from 202 autopsies were received from marine hospitals, prison hospitals, Indian Service hospitals, and other institutions. This material supplied

the human pathologic material previously referred to and further served for the training of junior officers in descriptive and diagnostic pathology.

DIVISION OF PUBLIC HEALTH METHODS

GEORGE ST. J. PERROTT, in charge

HEALTH AND MEDICAL SERVICES

Administrative practice.—Several studies on administrative practice were conducted during the year to determine to what extent increased effectiveness of operation in official health agencies will result from improvements in administrative techniques. In cooperation with the United States Children's Bureau, the health problems and needs of the city of Chattanooga, Tenn., were surveyed and detailed recommendations were made for the establishment of an effective health department in that city.

Municipal sanitation services.—Studies of municipal sanitation problems are being conducted in cooperation with the city health departments of Newark, N. J., and New Haven, Conn. Data for these studies have been collected and are now being processed.

Records.—The records and reporting systems of four State health departments and one large municipal health department have been studied and, with these studies as a basis, improved records systems have been devised which reduce the reporting burden without impairing or destroying the value of the records.

Public medical care.—At least \$150,000,000 of public funds is being spent annually for medical care of relief and low-income groups, largely without adequate medical direction or supervision. Unless health departments move toward supplying the medical direction and supervision needed, it seems clear that the public welfare agencies will soon obtain direction for themselves from some other source. Studies of the medical and hospital care provided for recipients of public assistance in New York, Minnesota, and Virginia reveal serious problems. Outstanding among these are needs for more rational administrative organization, better professional supervision, closer cooperation between the various agencies concerned, and more accurate recording of costs and volume of services. Indicated also is the need for amendment of the Social Security Act so that the Federal Government may match the sums expended by local and State welfare agencies in directly providing care to recipients of old age assistance, aid to the blind, and aid to dependent children.

Hospital care.—Increasing civilian population in defense areas is resulting in a deficiency of hospital facilities. A survey of 184 major defense areas indicated that at least 13,000 new hospital beds and 140 health centers would be required.

NUTRITION

Cooperative field studies in New York City and in Hagerstown, Md., were directed primarily toward the development of methods for diagnosing the subclinical forms of specific nutritional deficiencies. Tests have been completed on a group of 3,500 high school children and adults. Among the more important results of these studies were the following: (a) Development of a technique, through the

use of the corneal microscope, for diagnosing changes in the sclera which apparently represent early manifestations of vitamin A deficiency. (b) Recognition of an asymptomatic symmetrical lesion of the buccal mucosa which appears to be correlated with certain combinations of the avitaminoses. (c) Clarification of a relationship between the stage of maturation of adolescent children and hemoglobin content of the blood and the red blood cell count. (d) Further development of the dark adaptation technique and a failure to find a significant association of night blindness test results and vitamin A deficiency in the urban children and adults studied.

HOUSING AND HEALTH

The staff of this Division has cooperated with the various housing agencies of the Federal Government in the preparation of standards for defense housing, an emergency code for small residences, and advice as to the establishment of health centers in public housing projects. More recently, at the request of the Division of Defense Housing, a survey has been made of the need for hospital facilities and medical services in defense housing projects. Studies of the activities of health departments in the housing field have been started through job analyses of the routine housing inspections made by sanitary inspectors.

HEALTH EDUCATION

Personnel.—Five reports containing the results of a survey of the educational attainment and experience of full-time professional workers in official health departments have been published in Public Health Reports during the fiscal year. Types of personnel included were health officers and other medical personnel, nurses, sanitation personnel, and laboratory workers.

Health instruction.—With the cooperation of other agencies, this office is studying educational activities of physicians, nurses, and sanitarians by means of verbatim transcripts of nurses' home visits, municipal sanitation inspectors' visits, and health department physicians' interviews with mothers at baby welfare stations.

Studies of the public's knowledge of health information were continued during the year. A report based on the analysis of 36,000 health information tests from the New York World's Fair is now being edited. Analyses are being made of data from a similar study conducted in cooperation with the Pacific Branch of the Metropolitan Life Insurance Company at the San Francisco Golden Gate Exposition in 1940.

Health education and defense.—Plans for health education programs in extra-cantonment areas and in connection with defense vocational training programs have been worked out in cooperation with other agencies.

CONTROL OF SPECIFIC DISEASES

Tuberculosis.—Studies were made of two techniques, the tuberculin test and the roentgenogram of the chest, which represent the chief methods now in use for the public health control of tuberculosis. Determining skin sensitivity to tuberculin by means of graduated concentrations of the purified protein derivative of tuberculin, it

was shown that tests made with a dosage of 1/10,000 mg. of a standardized product would detect essentially all patients with tuberculosis and a very high proportion of persons who had had "contact" with the disease. It is apparent that careful regulation of dosage and potency of tuberculin should serve to improve greatly the diagnostic value of the tuberculin reaction.

Attempts to improve the X-ray microfilm resulted during the year in the production of a more sensitive photographic emulsion, the construction of a completely portable and highly efficient photo-roentgen unit, and the development of a technique for making stereoscopic 35 mm. X-ray films of the chest. Preliminary experience with these stereoscopic films indicates that many of the deficiencies of the 35 mm. film probably can be overcome and that this method of obtaining roentgenographic evidence of tuberculosis will have an important place in future public health programs. X-ray films, utilizing the 35 mm. technique, were made of approximately 10,000 inmates of State hospitals for the insane in Minnesota. Study of these records indicates that nearly 10 percent of the institutionalized insane have active reinfection type tuberculosis and establishes the fact that relatively few significant cases are missed in this type of survey.

Pneumonia.—A study has been made of the bacteriology of pneumonia in several areas representing sections of the country with widely differing pneumonia mortality. The results will provide information of fundamental value in understanding the epidemiology of the disease. In another investigation, a study is being made of all cases of acute respiratory disease and meningitis admitted during 2 seasons to 16 large hospitals in 8 large cities. The purposes are to assess the factors predisposing to the development of pneumonia, to evaluate the various current systems of therapy through coordination of experiments and compilation and analysis of results, and to measure the efficacy of treatments of influenza, acute bronchitis, and miscellaneous upper respiratory infections in the prophylaxis of pneumonic and meningeal complications.

Diarrheal diseases.—The epidemiological study of water-borne diseases has been continued. Indications are that gastro-enteritis, when water-borne, is of bacterial origin but the specific organism or organisms have not yet been fully determined.

Dental caries.—Results of physical examinations instituted by Selective Service and the National Youth Administration again have directed attention to the high prevalence of dental defects in the general population. Special studies were therefore made of dental status, dental needs, and the probable cost of giving reparative services, particularly for young men between the ages of 17 and 35 years. The records show, in addition to a large proportion of men who would not qualify for full military duty according to present Selective Service standards, an enormous accumulation of untreated dental defects which basically have their origin in neglect of the teeth during the earlier periods of childhood and adolescence. The cost of this neglect is shown to be many times what it would have been, had complete and systematic dental service been provided for the new crop of defects which arose annually in these men from the time their teeth first erupted. In the light of these findings other investigations on the dental problems of children were continued.

ENVIRONMENTAL SANITATION

Sewage and industrial waste treatment.—Further study on the basic factors involved in the oxidation and accumulation of organic matter in sewage has been continued and the study extended to include certain industrial wastes. In the last quarter, studies on the wastes from munitions plants and their possible effect on streams were begun, and will be continued into the coming year.

Scioto River study.—The study of the Scioto, designed primarily to show the effect of modern sewage disposal plants in improving the sanitary condition of streams, has been completed and a comprehensive report submitted for publication.

Statistical inventory of sanitation works.—Data have been gathered and tabulated on water treatment plants, sewerage systems, and sewage disposal plants. At the close of the fiscal year mimeographed copies were being prepared for distribution.

Illinois waterway pollution.—The continuing check of the observations made by the Sanitary District of Chicago, begun in July 1938, was closed on October 31, 1940. Our observations agreed, within allowable limits, with those of the Sanitary District.

Ohio River pollution survey.—This survey, begun late in 1938 under provisions of an act of Congress, was practically completed at the end of the fiscal year. Only certain parts of the final report remain to be finished. As the report of the survey is to be made to the United States Army Corps of Engineers, which in turn reports to the Congress, discussion of the detailed results must be withheld until released by the proper authorities. It may be said in general that the survey has resulted in collection of a vast amount of data that will be of valuable assistance in solving problems in connection with stream pollution.

Shellfish studies.—In cooperation with the Virginia State Department of Health, a study of shellfish scoring methods is being made at a laboratory on Craney Island. The work has required the simultaneous employment of a variety of techniques on samples of water and oysters taken from polluted and nonpolluted areas. It has been found that the presumptive test for coliform bacteria is affected by such circumstances as whether oyster liquor or macerated oyster meat is employed, the salinity of the dilution water used, the interference of *pseudomonas* and certain sporogenous bacteria in sea water, and by many other factors. Study of these is directed toward more adequate bacteriological methods of appraising the suitability of shellfish for human consumption.

HEALTH STATISTICS

Current reports.—Provisional mortality summaries for a considerable list of diseases are prepared quarterly and annually from data supplied by State health departments. A summary of the prevalence of nine acute communicable diseases is prepared at 4-week intervals.

Selective Service data.—Analysis of the results of physical examinations made under the Selective Service Act showed that 43 percent of the examined men were unfit for general military service. These figures comprised examinations at both local boards and induction centers. Of the number examined, 28 percent were classified as not fit for any military service and 15 percent as fit for limited service

only. These findings indicate higher rates of rejection than in the World War, but differences in physical examination standards, improved diagnostic techniques, and other factors make it difficult to determine the significance of the differences. The important point is that a large proportion of men in the most healthy ages are not in sufficiently good health to be accepted and that many of the conditions from which they suffer are of a remediable nature. Furthermore, it must be realized that the impairments from which many of these young men suffer could have been prevented by more adequate public health programs during the period of their growth. The most striking difference between the results of 1917-18 and today is the present high percentage of rejections because of defective teeth, the rate being over four times as high as in the World War draft.

N. Y. A. health program.—This Division has cooperated with the National Youth Administration in planning a health program for N. Y. A. enrollees and is directing the statistical analysis of physical examination data. Results so far obtained point to the urgent need for the rehabilitation program planned by the N. Y. A.

National Health Survey.—Numerous reports on the data collected in the National Health Survey were published or submitted for publication during the year. The broad scope of this material is indicated in the subjects covered: Receipt of medical services in different population groups, medical and nursing care for maternal cases, estimates of military and industrial manpower from the point of view of physical condition, disabling illness among male and female workers and housewives, crowding, illness, and accidents under different housing conditions, accidents in the home, public accidents, industrial injuries, blindness, socioeconomic and employment status of youth, changes in rates of reproduction.

Cancer mortality and morbidity.—The last of four bulletins on cancer mortality was completed. Preliminary reports were completed for each of the ten urban areas in which surveys of the incidence of cancer were conducted during the preceding 2 years. Both mortality and prevalence studies show high gastric cancer rates in the North and high skin cancer rates in the South.

Classification of physical impairments.—Considerable time was spent with the Medical Division of the United States Selective Service Headquarters in helping to set up a classification of physical and mental impairments suitable for the tabulation of defects found among men examined for service in the United States Army. Some 15 to 25 different organizations in the Federal Government are making some use of physical examination data, and a standard statistical classification of the defects would seem to be desirable even though the examinations themselves differ widely in type.

Baltimore survey.—The study of illness and medical care among 1,500 white families of the Eastern Health District of Baltimore, Md., was continued throughout the year. Analysis of the Baltimore records indicates that persons with chronic disease carry the main burden of illness after the age of 40. The presence of chronic disease even in its earlier stages is a factor in increasing the rate of illness from nonchronic causes.

Familial studies.—Data collected at Hagerstown, Md., during the past 20 years continues to furnish material for intensive studies in

which the family is the fundamental unit of investigation. Published reports on mortality in husbands and wives and in brothers and sisters brought out evidence of a significant association between deaths from cancer in husbands and wives which has important implications of the effect of a common environment during adulthood in the etiology of cancer. Other reports deal with changes in the incidence and in the causes of morbidity of school children during the past two decades, and with a gradual but significant increase in the height and weight of Hagerstown children since the recent economic depression.

Duration of disability.—Tables showing the relative number of cases of disabling illness classified by duration of the illness were constructed for various classes of the population from data collected in the National Health Survey. The population classes for which disability tables were constructed are those which might be included in a disability insurance system.

DIVISION OF ZOOLOGY

Professor WILLARD H. WRIGHT in charge

TRICHINOSIS

Incidence.—Much of the investigational work originally planned has been completed but incidence studies have been continued in some population groups not previously sampled.

Additional random samplings of diaphragm material from hospitals selected on a chance basis have brought the total number of examinations in this series to 1,077, of which 198, or 18.4 percent, were positive for the trichina parasite.

With the view of ascertaining whether differences exist in exposure to trichinosis in urban and rural areas, 314 diaphragms have been examined from individuals from the rural population. Of these cases, 37, or 11.8 percent, were positive for trichinae.

In a cooperative investigation with the Washington State Department of Health, there has been examined material from 92 individuals who came to necropsy in hospitals in that State; 20, or 21.7 percent, were infected with the parasite.

In all, there have been examined to date 4,997 diaphragms from 171 hospitals in 37 States and the District of Columbia; 827, or 16.5 percent, of these diaphragms have been positive for trichinae.

Epidemiology.—Data on the 3,000 diaphragms in the base series of examinations of material from Washington, D. C., and 5 eastern seaboard cities indicated that there was no direct correlation between trichina infection and race, civil or military status, past military service, sex, occupation, mental hospitalization, or social-economic status. The 3,000 cases included 336 persons of foreign citizenship or whose names indicated foreign extraction, of whom 86, or 25.6 percent, were infected. Individuals in the German and Italian groups totaled 196, of whom 56, or 28.6 percent, were infected. A comparison of these figures with an incidence of 15.2 percent in 2,627 American Negroes and whites of English-Scotch-Irish descent would seem to indicate that persons of foreign extraction are more frequently exposed to trichinosis.

In an examination of 555 composite 100-gram samples of pork scraps from residential garbage, a considerable part of which is fed to swine, 1.6 percent were found positive for trichinae. One-third of the positive samples contained viable parasites even though the pork had been cooked. It is evident that the cooking of pork as usually practiced is not sufficient customarily to destroy all trichinae and that hogs are readily exposed to trichinosis through pork scraps in garbage.

Diagnosis.—In an effort to evaluate in terms of clinical trichinosis the significance of larval counts in routine examination of diaphragm material, biopsied muscle from 32 acute cases of the disease was examined both by the direct microscopic method and the digestion-Baermann method. Only 6 of these samples were positive for trichinae, thus indicating that the biopsy has relatively little merit as a diagnostic procedure. In addition, larval counts were made on the diaphragm and other muscles from 5 persons succumbing to the disease. While more data are needed to establish the point, it appears probable that relatively light trichina infections may result in marked clinical symptoms.

Intensive studies were made in outbreaks of trichinosis in Washington, D. C., and in nearby Virginia. Results on the use of the intradermal, complement fixation, and precipitin tests on these cases indicated that the last mentioned was most accurate. Counts of trichina larvae in the pork responsible for the Virginia outbreak revealed 86 per gram in the tongue, 28 per gram in the masseter, 39 per gram in the shoulder, and 16 per gram in the ham.

During the year, 4,242 intradermal doses of trichina antigen were supplied to health officials and cooperating agencies in the United States and 6 foreign countries. Precipitin tests were conducted on 205 samples of blood serum, of which 101 were positive.

Therapy.—Tests with sulfaguanidine in experimental trichinosis failed to indicate that the drug had any therapeutic effect.

OXYURIASIS

During the first 6 months of the year, problems already under investigation were completed and further work on the project suspended. During these months, there were examined by the NIH swab technique an additional 333 persons, of whom 72, or 21.6 percent, were positive for pinworms.

In necropsy studies on 72 children, 21 were found infected with pinworms. Worms were encountered less frequently in the small intestine than in the large intestine and those in the small intestine were predominantly males. In no case were pinworms encountered in the small intestine without a similar finding in the large intestine.

Additional quantitative evidence was obtained to indicate the familial nature of pinworm infection, a matter of considerable importance from a control standpoint. In only 70 of 286 white families was infection apparently confined to a single case, whereas in the remaining 216 families there was an average of 3.4 positive persons per family. In almost half of the white families, all children examined were found positive.

AMEBIASIS

Research was continued in the Washington laboratory and in the Tulane Amebiasis Unit, New Orleans, La.

Cultural studies.—Investigations proceeded along several lines with the ultimate objective of cultivating *Endamoeba histolytica* either free from bacteria or with single species of bacteria for the preparation of potent antigens for diagnostic purposes. Such an objective necessitated studies on the physiology of the ameba, the relationship of various bacteria to growth *in vitro* and the influence on cultivation of accessory factors and various substitutes for components of the media. In addition to the *in vitro* experiments, unsuccessful attempts were made to establish pure cultures of the organism in guinea pig embryos, chick embryos, and the liver of kittens.

The use of the microisolation technique described in last year's report was continued for the preparation of cultures. It was found that selection of tetra-nucleate cysts for seeding cultures resulted in best growth. Success in culturing was enhanced considerably by the discovery that a 1:25,000 solution of neutral red was a fairly accurate index of the viability of the cysts. To date, of 93 tubes seeded with cysts which failed to take the stain, 52, or 55.9 percent, became positive for amebae while none of 59 tubes seeded with stained cysts became positive.

During the year, 1,400 cultures were set up by microisolation and 33 species of bacteria, 1 species of yeast, and 2 species of molds were tested to determine whether these organisms would support the growth of amebae in the L. E. S. R. medium. Growth was obtained with the following organisms: *Streptococcus hemolyticus* 563, *Salmonella schottmuelleri*, *Leptotrichia buccalis*, *Staphylococcus aureus* 621, *Bacillus subtilis*, *Actinomyces muris*, 3 species of *Enterococcus*, *Aplanobacter stewartii*, *Bacterium coronafaciens*, *Bacillus mesentericus*, *Streptococcus viridans*, and *Neisseria catarrhalis*. *L. buccalis* was found to promote best growth of *E. histolytica* and culture yield has been sufficiently heavy for use in antigen production.

Attempts have been made to promote more abundant growth by the addition of accessory factors such as nicotinamide, thiamine hydrochloride, tryptophane, liver extract, dried liver powder, milk and meat biuret-free aminoids, tryptic digests of egg, and cysteine hydrochloride. However, none of these substances was found to accelerate the growth of the amebae.

Since the starch in the L. E. S. R. medium is a troublesome factor in the production of antigen, soluble carbohydrates such as glucose, maltose, sucrose, xylose, and raffinose have been substituted for the starch but without success.

In cultures with *L. buccalis*, a relatively low oxygen tension accelerates the excystation of the amebae. While cultures of cysts with this organism usually require 3 to 4 days under ordinary atmospheric conditions before trophozoites are produced, similar cultures in an atmosphere of about 15 percent CO₂ yielded trophozoites after 1 to 2 days. It is believed that *L. buccalis* lowers the oxidation-reduction potential of the medium to a point favorable for excystation and growth of the amebae.

Diagnosis.—Twenty-six different antigens have been produced from cultures of *E. histolytica* grown with the above-mentioned organism. Complement fixation tests on the blood serum of immunized rabbits and in human cases of amebiasis indicated that some of these antigens possessed marked potency and were a hundredfold more efficient than the alcoholic extract antigens commonly used in this test. Serum both from uninfected individuals and those infected with *E. histolytica* failed to react on the complement fixation test with pure antigens of *L. buccalis*. Many of the individuals harboring *E. histolytica* failed to give positive complement fixation reactions with the alcoholic antigen but gave markedly positive reactions with the experimental antigens. However, some infected, asymptomatic individuals failed to react positively with any of the antigens. While the results to date appear promising, much more work is needed before conclusions can be drawn as to the practical application of this method of diagnosis.

At New Orleans, evidence was obtained showing a rather definite cyclic output of cysts of *E. histolytica* and *E. coli* in rhesus monkeys. The average peak of cyst production occurred every 6.8 days. The fluctuation was independent of the amount of feces, the moisture content of the stool, or the season of the year. A high protein diet may have some influence in reducing the output of cysts.

At Washington, routine complement fixation tests for amebiasis were conducted on 72 samples of blood serum forwarded by physicians and hospitals; 13 of these samples were positive.

Incidence and epidemiology.—Of 141 children examined in a New Orleans institution, 59, or 41.8 percent, were found positive for *E. histolytica*. A sanitary engineering survey of the institution revealed a few potentialities for contamination of the water supply, but the character of the infection and the fact that none of the Sisters in the institution was found positive argue against water-borne dissemination. Likewise, it does not appear that food handlers are responsible for the transmission of the organism. Transmission appears to be of the hand-to-mouth type. Evidence for this was obtained when moist swabs taken from around the mouth region of the children provided positive cultures of *Escherichia coli*. Cysts of *Endamoeba coli* and ova of *Enterobius vermicularis* were found around the seats and benches in the playground. Furthermore, seemingly viable cysts of *E. histolytica* were isolated from the moist sand in the sand box used by the children.

A study of *E. histolytica* in accident cases coming to necropsy in New Orleans was completed. Thirteen, or 6.4 percent, of 202 individuals were positive. In 5 of the 13 cases there was concrete evidence of a mild type of tissue invasion.

Clinical studies.—No hematological differences were noted between infected and noninfected individuals in the above-mentioned institution and no occult blood was found in the feces of any of the infected children. Physical findings failed to reveal important differences although children in the infected group showed evidence of excessive abdominal tenderness with a higher percentage of cases of palpable sigmoid colon. From the standpoint of nutrition, more cases of undernourishment and rickets were encountered in the infected group. In spite of the absence of marked symptoms, strains of *E. histolytica* recovered from the infected children were found pathogenic for dogs.

Control measures.—In preliminary experiments designed to determine the effect of water chlorination, cysts of *E. histolytica* were killed within 1 hour on exposure to 7 p. p. m. of chlorine in one experiment and in a second experiment were killed within 10 minutes on exposure to a concentration of 8 p. p. m.

OTHER INVESTIGATIONS

In connection with work of the Division of Infectious Diseases, a parasite survey was made of 44 households in rural areas in Ross County, Ohio. Fecal samples from 268 individuals were examined with a total of 155 positive for parasites. The positive findings were as follows: *Ascaris lumbricoides* 5, or 1.9 percent; *Hymenolepis nana* 11, or 4.1 percent; *Trichuris trichiura* 7, or 2.6 percent; *Enterobius vermicularis* 5, or 1.9 percent; hookworm 2, or 0.7 percent; *Strongyloides stercoralis* 2, or 0.7 percent; *Endamoeba coli* 131, or 48.8 percent; *Endamoeba histolytica* 30, or 11.2 percent; *Chilomastix mesnili* 18, or 6.7 percent; *Iodamoeba bütschlii* 16, or 6 percent; *Giardia lamblia* 12, or 4.5 percent; and *Endolimax nana* 11, or 4.1 percent. Two hundred and eight soil samples, representing collections from 43 farms, were examined with a total of 29 samples, or 13.9 percent, positive for ova of *Ascaris lumbricoides*. The 29 positive samples represented collections from 21 farms.

During the year, routine stool examinations for the diagnosis of intestinal parasitism were made on 515 individuals. Hookworm infection was found in 32 cases, *Trichuris trichiura* in 13, *Ascaris lumbricoides* in 7, *Hymenolepis nana* in 4, *Strongyloides stercoralis* in 4, and *Endamoeba histolytica* in 5.

A total of 577 specimens of external and internal parasites were received and identified during the year.

Positive results were obtained on complement fixation tests for echinococcus infection on 4 of 20 samples of blood serum.

COOPERATIVE STUDIES

Medical Director JAMES P. LEAKE in charge

The most notable success of an immediately practical nature in the group of cooperative studies under the general supervision of the National Institute of Health for this year has been that on the prevention of whooping cough. The Norfolk City Union of King's Daughters Visiting Nurse Association, in cooperation with the Division of Infectious Diseases, Section of Epidemiology, has been conducting a study on the effects of a two-dose alum-precipitated pertussis vaccine devised in the Division of Biologics Control. The first report on this study was in process of publication at the end of the fiscal year and showed unequivocally that this vaccine does yield substantial protection against the disease. The data being accumulated are adequate to form minimal estimates as to the amount and duration of such protection. This method thus becomes the only method suitable for wide public health use which has demonstrated value against the disease. If a combination of this immunizing agent with alum-precipitated diphtheria toxoid proves effective, immunization against these two serious diseases of infancy and early childhood could be accomplished with a single set of two injections.

Other studies which have received aid during the year are tuberculosis among Indians and Negroes, diphtheria immunization, malaria prophylaxis, physiology of artificial fever, cytology of leprosy, biological and medical studies of the Eskimo, and chemical fractionation of the pertussis bacillus.

LIBRARY

The library of the Institute added 1,057 volumes during the fiscal year, making a total of 22,355 bound volumes now on the shelves. There were 481 periodicals received, of which 293 were paid subscriptions. Many domestic and foreign serial publications were received. A total of 12,669 books and periodicals was circulated; of these 12,545 were circulated within the Institute and 124 to other libraries and individuals, and 3,382 were borrowed from other libraries, making a total circulation of 16,051. The number of photostat pages received was 4,236, bibliofilm pages 1,982, and medicofilm pages 3,139; the last mentioned covered a period of 7 months only.

PUBLICATIONS

Two National Institute of Health Bulletins and 12 Public Health Bulletins were completed and sent to the Government Printing Office during the fiscal year 1941.

Scientific papers recommended for publication in Public Health Reports numbered 117; 343 were approved for publication in outside journals or presentation at society meetings; and 47 papers were reviewed at the request of other Divisions of the Public Health Service or outside agencies.

RECOMMENDATIONS

It is recommended that the laboratory facilities of the Industrial Hygiene Division be expanded in connection with studies in aviation medicine and in connection with analyses and toxicological studies of the many new compounds which are being used in general industry and in defense production.

It is recommended that at least two new buildings be provided at the National Institute of Health to house those laboratory facilities which are not at the present time incorporated in the Institute at Bethesda. The work now being done at Craney Island for the investigation of shellfish pollution as well as studies in aviation medicine require such facilities.

In view of the very serious epidemic of equine encephalitis in the Middle West, additional funds are greatly needed for the study of this disease and related virus diseases.

DIVISION OF FOREIGN AND INSULAR QUARANTINE AND IMMIGRATION

Assistant Surgeon General M. C. GUTHRIE in charge

Owing to World War conditions, only meager and incomplete reports on the incidence of the quarantinable diseases in foreign countries have been received during the past year. Information on hand, however, indicates that some of the quarantinable diseases reached epidemic proportions in certain countries.

An unusually high incidence of plague was reported in Morocco and Egypt, as well as in India. Other countries reporting a significant incidence are Algeria, Argentina, Brazil, China, Dutch East Indies, Ecuador, Madagascar, Peru, Thailand, Uganda, and the Union of South Africa. Cholera was especially prevalent in China and India, and cases were reported from Ceylon and Thailand. Yellow fever was reported in epidemic form during the latter part of 1940 in the Anglo-Egyptian Sudan, with approximately 8,000 cases and more than 800 deaths. Cases were also reported from the Belgian Congo, Gold Coast, Ivory Coast, Nigeria, French Sudan, and Togo in Africa, and from Bolivia, Brazil, and Colombia in South America. Typhus fever was prevalent in Bulgaria, Germany, Rumania, Spain, and Turkey, and in Algeria, Belgian Congo, Bolivia, China, Egypt, Guatemala, and Peru. India, as usual, reported the highest incidence of smallpox, which was also prevalent in the Belgian Congo, Bolivia, China, Chosen, Colombia, Japan, Nigeria, Portugal, and Spain.

Measures against the introduction of quarantinable diseases into the United States ports were successful. Despite a large influx of war refugees, complicated by overcrowding and insanitary conditions on vessels which carried them, no case of a quarantinable disease reached a United States port during the year. Early in the year, a tentative diagnosis of pneumonic plague was made in the case of a dead seaman aboard a Panamanian steamship arriving at Boston, Mass., from Marseilles. The diagnosis was not confirmed on the basis of autopsy, animal inoculation, and bacteriological and pathological examination, nor was evidence of plague found in the 46 rats recovered following fumigation of the vessel.

In spite of the fact that fewer vessels from foreign ports reached United States territory during the year, the work of all quarantine stations was increased and made more difficult as a result of the marked dislocation of shipping caused by disturbed world conditions. Among the factors which increased the problems of quarantine administration may be mentioned: (1) The discontinuance by the International Office of Public Health, Paris, France, of the dissemination of information pertaining to the health status of ports in Europe, Asia, Africa, and Australia; (2) the arrival of vessels from belligerent and nonbelligerent countries without advance notice; (3)

the diversion of American shipping from normal trade routes to Europe to ports in Africa and the Far East; and (4) the threat of the introduction of bubonic plague from the increasing number of rat-infested tramp cargo carriers in poor sanitary condition.

Because of the prevalence of smallpox in Spain, all passengers and crew embarking at Lisbon for the United States were required to be vaccinated prior to sailing unless they were able to show satisfactory evidence of active immunity to the disease. The Department of State cooperated with the Public Health Service by explaining the foreign health situation to all applicants for passports to Europe and by suggesting that prospective travelers be vaccinated before sailing unless their immunity to smallpox had been definitely established.

The rapid expansion of airplane service to the United States and the increased incidence of yellow fever in foreign countries not only required greater vigilance on the part of quarantine officers to prevent the introduction of this disease, but also made necessary the development of new and more effective precautionary measures.

During the year, aircraft disinsectization bases were established at Barranquilla, Colombia, and Maracaibo, Venezuela, and inspection bases at Kingston, Jamaica, and Port-au-Prince, Haiti. A count of the number of live insects reported on planes before disinsectization at the above-mentioned disinsectization stations checked against the number of dead insects recovered at inspection stations has proved the value of these procedures.

A large number of flight personnel of the Pan American Airways were immunized against yellow fever, smallpox, and typhoid fever. This company has continued its efforts to prevent the introduction of mosquitoes by routinely spraying its planes before their arrival in the United States. Steps have also been taken to prevent the breeding of mosquitoes around airports.

In the absence of quarantinable diseases or epidemic conditions at ports of departure or call, nonstop flights of military aircraft of the United States are permitted between the United States and the following areas without quarantine restrictions: Puerto Rico, Canal Zone, Virgin Islands, Alaska, Canada, Cuba, Bahama Islands, and certain islands of the Caribbean area where United States air bases are projected. Military aircraft having contact with all other areas are still required to undergo the prescribed quarantine inspection and treatment.

In line with recommendations presented at Pan American commercial and technical aviation conferences within the past few years, representatives of the various United States Government departments and agencies concerned carefully studied the problem of combining in one text, as far as practicable, the separate sets of public health, customs, entry and clearance, and immigration regulations relating to aircraft engaged in international air commerce. A final draft of proposed regulations, incorporating, among other changes, those suggested by the Public Health Service, was prepared just prior to the close of the fiscal year and will in all probability be adopted at an early date.

Sanitary inspections of coastwise vessels, inaugurated during the last fiscal year, were continued with marked improvement in the

condition of these vessels being shown. The cooperation extended by the shipping companies involved has been excellent.

During the latter part of the year under report, 24-hour quarantine inspection of arriving cargo vessels was instituted at the port of San Francisco, Calif.

Pursuant to the passage of an act of Congress of July 10, 1940, amending section 2 of the basic Quarantine Act of February 15, 1893, the Quarantine Regulations of the United States were further amended to provide that, in the absence of quarantinable diseases at foreign ports of departure or call, vessels operating exclusively between ports in the Republic of Cuba and in the Bahama Islands and ports in the United States, and vessels operating exclusively between ports on the west coast of Lower California and ports in the State of California shall be exempted from obtaining consular bills of health at Cuban and Bahama Islands ports and at ports on the west coast of Lower California, respectively, and from quarantine inspection upon arrival at United States ports. Such vessels, however, are still subject to inspection to determine rat infestation and, when found rat infested, to deratization measures. Prior to the issuance of this amendment, vessels from the above-named countries arriving only at ports in the United States south of certain designated degrees of north latitude were accorded the above-mentioned exemptions.

During the fiscal year 1941, the headquarters of ship ratproofing was transferred from Washington, D. C., to the United States Quarantine Station at Rosebank, N. Y. From the field offices at New York and San Francisco, ship ratproofing work was carried on through a limited corps of sanitary inspectors who visited shipyards throughout the country to insure uniformity in ship ratproofing construction. Technical advice on ship ratproofing was also given to the Maritime Commission and to a number of Navy Yards.

After being leased to the Government for many years at a nominal rental, the land and buildings comprising the Marcus Hook, Pa., Quarantine Station property were donated to the United States of America by the State of Pennsylvania by an act of the general assembly approved by the Governor on May 19, 1941. It is intended to enlarge this station to serve the port of Philadelphia and vicinity.

The Service quarantine station at Gadsden Point, about 15 miles from Tampa, Fla., was transferred during the year to the War Department for use in connection with national defense activities. A small but adequate quarantine station will be constructed on Davis Island located within the corporate limits of the port of Tampa.

Construction was commenced on a new quarantine station at San Juan, P. R., to replace the present station which is to be transferred to the Navy Department.

Since January 1, 1941, medical examinations of aliens arriving at ports in the Philippine Islands have been conducted by medical officers of the Philippine Commonwealth in accordance with the provisions of a Commonwealth Act approved by the President of the United States. The medical examinations, for immigration purposes, of aliens arriving at Philippine ports which have heretofore been performed by officers of the United States Public Health Service have accordingly been discontinued.

Owing to the present world conditions, the lack of knowledge of actual incidence of quarantinable diseases, the relaxing of disease

control measures in foreign countries, and the certainty of the increase and spread of epidemic diseases during and after the war, it would be dangerous to consider at this time any curtailment of quarantine facilities at United States ports.

Condensed statistical information showing the quarantine and immigration activities for the year is presented in the following tables.

TRANSACTIONS OF MARITIME QUARANTINE STATIONS

TABLE 1.—Summary of transactions at maritime stations for the fiscal year 1941

Station	Vessels inspected	Vessels granted free pratique	Vessels fumigated		Deratization exemption certificates issued	Passengers inspected	Crew inspected	Bills of health and port sanitary statements issued	Amount of bills rendered for quarantine services
			Cyanide	Sulfur					
Aberdeen, Wash.....	4	4	0	0	0	0	137	434	\$40.00
Astoria, Oreg.....	15	15	0	0	0	0	340	1,610	155.00
Baltimore, Md.....	747	652	46	0	407	1,256	29,052	7,937	15,722.67
Boca Grande, Fla.....	13	13	0	0	0	2	314	0	150.00
Boston, Mass. ¹	596	447	64	0	100	2,959	27,022	2,504	10,665.78
Brunswick, Ga.....	0	0	0	0	0	0	0	30	0
Carrabelle (St. Georges Sound), Fla.....	12	12	0	0	0	0	122	0	70.00
Charleston, S. C.....	182	166	7	0	10	5,707	8,688	363	2,376.18
Corpus Christi, Tex. ²	28	18	0	0	0	0	948	221	255.00
Eastport, Maine.....	1	1	0	0	0	0	28	-----	10.00
Eureka, Calif.....	1	0	0	0	0	0	69	17	10.00
Fall River, Mass.....	2	2	1	0	5	11	73	36	184.36
Fernandina (Cumberland Sound), Fla.....	1	1	0	0	0	0	32	8	10.00
Fort Lauderdale (Port Everglades), Fla.....	26	26	0	0	0	7	893	0	450.00
Fort Monroe, Va.....	538	410	51	0	119	6,925	87,037	2,903	7,576.61
Fort Pierce, Fla.....	1	1	0	0	0	1	43	0	10.00
Freeport, Tex.....	3	3	0	0	0	0	96	0	30.00
Galveston, Tex.....	479	441	10	0	111	337	17,941	3,873	6,358.25
Georgetown, S. C.....	1	1	0	0	0	0	37	7	10.00
Gulport, Miss.....	7	5	0	0	0	0	222	16	70.00
Jacksonville (St. Johns River), Fla.....	189	181	2	0	19	48	4,326	640	1,861.60
Key West, Fla.....	44	40	0	0	5	27	3,234	83	125.00
Los Angeles, Calif.....	1,117	954	32	0	178	18,051	56,727	5,658	17,358.21
Marshfield (Coos Bay), Oreg.....	1	1	0	0	0	0	32	18	20.00
Miami, Fla.....	71	68	2	0	25	1,159	2,496	702	930.40
Mobile, Ala.....	337	309	16	0	91	329	10,242	2,389	4,775.84
Morehead City, N. C.....	6	6	0	0	0	0	201	0	60.00
New Bedford, Mass.....	6	6	0	0	0	32	152	1	55.00
New London, Conn.....	0	0	0	0	0	0	0	27	0
New Orleans, La.....	744	505	22	0	191	5,229	28,982	4,995	11,934.20
Newport, R. I.....	1	1	0	0	0	16	37	13	10.00
New York, N. Y. ³	3,173	1,552	90	0	776	130,146	223,975	15,601	46,530.31
Ogdensburg, N. Y.....	0	0	0	0	0	0	0	0	0
Panama City (St. Andrews Bay), Fla.....	0	0	0	0	0	0	0	56	0
Pensacola, Fla.....	28	25	1	0	*1	10	961	92	397.03
Philadelphia (Marcus Hook), Pa.....	794	649	58	0	222	764	30,415	3,268	14,821.31
Port Isabel (Brownsville), Tex.....	0	0	0	0	0	0	0	6	0
Portland, Maine.....	43	40	0	0	8	7	1,564	88	530.00
Portland, Oreg.....	63	61	15	0	35	461	2,912	2,446	1,847.22
Port St. Joe, Fla.....	2	2	0	0	0	0	42	19	30.00
Providence, R. I.....	36	36	0	0	0	1	1,327	35	430.00
Sabine, Tex.....	151	141	0	0	37	16	5,045	0	1,595.00
San Diego (Point Loma), Calif.....	208	157	0	0	132	23	3,211	914	2,715.00
San Francisco (Angel Island), Calif.....	463	334	8	0	87	22,517	34,312	0	7,896.95
San Luis Obispo (Port San Luis), Calif.....	49	44	0	0	12	3	2,154	0	1,150.00

¹ Includes Plymouth, Mass.² Includes Ingleside and Harbor Island, Tex.³ Includes Perth Amboy, N. J.

TABLE 1.—Summary of transactions at maritime stations for the fiscal year 1941—Continued

Station	Vessels inspected	Vessels granted free pratique	Vessels fumigated		Deratization exemption certificates issued	Passengers inspected	Crew inspected	Bills of health and port sanitary statements issued	Amount of bills rendered for quarantine services
			Cyanide	Sulfur					
Savannah, Ga.....	68	47	3	0	11	10	1,955	229	1,177.63
Searspoint, Maine.....	0	0	0	0	0	0	0	0	0
Seattle, Wash. ⁴	89	83	12	0	63	868	4,134	2,907	2,256.30
South Bend, Wash.....	2	2	0	0	0	0	82	46	20.00
Tampa, Fla.....	193	170	7	0	26	206	3,548	1,421	2,009.80
Vineyard Haven, Mass.....	2	0	0	0	0	0	0	0	0
West Palm Beach, Fla.....	2	2	0	0	0	0	12	269	10.00
Wilmington (Cape Fear), N. C.....	23	13	0	0	3	3	664	27	355.00
Total.....	10,560	7,647	447	0	2,674	197,131	595,886	61,909	165,125.66
Alaska:									
Ketchikan.....	0	0	0	0	0	0	0	0	0
Wrangell.....	0	0	0	0	0	0	0	0	0
Hawaii:									
Ahukini.....	0	0	0	0	0	0	0	27	0
Hilo.....	5	5	0	0	0	55	217	248	40.00
Honolulu.....	306	279	5	0	20	29,825	31,190	1,523	5,031.00
Kahului.....	0	0	0	0	0	0	0	206	0
Lahaina.....	0	0	0	0	0	0	0	36	0
Mahukona.....	0	0	0	0	0	0	0	42	0
Port Allen.....	0	0	0	0	0	0	0	25	0
Total.....	311	284	5	0	20	29,880	31,407	2,107	5,071.00
Philippine Islands:									
Appari.....	5	0	0	0	0	0	201	6	-----
Cavite.....	4	4	0	0	0	0	407	11	-----
Cebu.....	91	0	1	83	0	352	4,356	240	-----
Davao.....	57	0	0	0	0	812	3,776	94	-----
Hilo.....	55	1	0	29	0	12	2,178	191	-----
Jolo-Sulo.....	20	0	0	0	0	192	563	22	-----
Jose Panganiban.....	118	0	0	0	0	9	5,137	132	-----
Legaspi.....	68	0	0	0	0	0	2,818	84	-----
Manila.....	1,047	211	150	114	0	74,367	93,576	1,092	-----
Olongapo.....	3	2	0	0	0	0	876	2	-----
Zamboanga.....	33	0	0	51	0	251	1,403	72	-----
Total.....	1,501	218	151	277	0	75,995	115,291	1,946	-----
Puerto Rico:									
Aguadilla.....	2	2	0	0	0	0	40	52	15.00
Arecibo.....	0	0	0	0	0	0	0	5	0
Arroyo.....	1	1	0	0	0	0	31	26	10.00
Central Aguirre.....	1	1	0	0	0	0	35	57	10.00
Fajardo.....	1	1	0	0	0	0	7	166	5.00
Guanica.....	19	19	0	0	1	101	272	41	105.00
Humacao.....	4	4	0	0	0	0	140	67	35.00
Mayaguez.....	32	32	0	0	0	0	293	264	175.00
Ponce.....	52	52	0	0	3	8	739	374	305.00
San Juan.....	273	268	8	0	35	2,901	10,465	1,210	2,870.85
Total.....	385	380	8	0	39	3,010	12,022	2,262	3,530.85
Virgin Islands:									
Charlotte Amalie.....	608	210	2	0	34	1,579	17,992	1,407	6,851.64
Christiansted.....	10	10	0	0	0	12	60	237	50.00
Frederiksted.....	27	21	0	0	0	37	675	99	385.00
Total.....	645	241	2	0	34	1,628	18,727	1,743	7,286.64
Total, all stations.....	13,402	8,770	613	277	2,767	307,644	773,333	69,967	181,014.15

⁴ Includes all ports on Puget Sound.

TABLE 2.—Statement of quarantine services rendered at maritime quarantine stations during the fiscal year 1941

Station	Inspection services	Detention services	Special services	Fumigation services	Total charges
Aberdeen, Wash.	\$50.00	0	0	0	\$50.00
Astoria, Oreg.	155.00	0	0	0	155.00
Baltimore, Md.	8,180.00	0	\$4,070.00	\$3,472.67	15,722.67
Boca Grande, Fla.	150.00	0	0	0	150.00
Boston, Mass. ¹	6,671.00	\$310.00	1,000.00	2,684.78	10,665.78
Brunswick, Ga.	0	0	0	0	0
Carrabelle (St. Georges Sound), Fla.	70.00	0	0	0	70.00
Charleston, S. C.	1,930.00	0	100.00	316.18	2,356.18
Corpus Christi, Tex. ²	255.00	0	0	0	255.00
Eastport, Maine	10.00	0	0	0	10.00
Eureka, Calif.	10.00	0	0	0	10.00
Fall River, Mass.	25.00	0	50.00	109.36	184.36
Fernandina (Cumberland Sound), Fla.	10.00	0	0	0	10.00
Fort Lauderdale (Port Everglades), Fla.	450.00	0	10.00	0	450.00
Fort Monroe, Va.	3,625.00	0	1,275.00	2,676.61	7,576.61
Fort Pierce, Fla.	10.00	0	0	0	10.00
Freeport, Tex.	20.00	0	0	0	20.00
Galveston, Tex.	4,750.00	0	1,115.00	513.26	6,358.26
Georgetown, S. C.	10.00	0	0	0	10.00
Gulfport, Miss.	70.00	0	0	0	70.00
Jacksonville (St. Johns River), Fla.	1,630.00	0	190.00	41.60	1,861.60
Key West, Fla.	85.00	0	40.00	0	125.00
Los Angeles, Calif.	12,988.00	0	1,770.00	2,600.21	17,358.21
Marshfield (Coos Bay), Oreg.	10.00	0	10.00	0	20.00
Miami, Fla.	626.00	0	250.00	54.40	930.40
Mobile, Ala.	3,490.00	0	925.00	360.84	4,775.84
Morehead City, N. C.	60.00	0	0	0	60.00
New Bedford, Mass.	55.00	0	0	0	55.00
New London, Conn.	0	0	0	0	0
New Orleans, La.	8,075.00	0	2,022.50	1,836.70	11,934.20
Newport, R. I.	10.00	0	0	0	10.00
New York, N. Y. ³	31,707.00	0	7,750.50	7,072.81	46,530.31
Ogdensburg, N. Y.	0	0	0	0	0
Panama City (St. Andrews Bay), Fla.	0	0	0	0	0
Pensacola, Fla.	265.00	0	10.00	122.03	397.03
Philadelphia (Marcus Hook), Pa.	8,975.00	0	2,220.00	3,626.31	14,821.31
Port Isabel (Brownsville), Tex.	0	0	0	0	0
Portland, Maine	450.00	0	80.00	0	530.00
Portland, Oreg.	716.00	0	360.00	771.22	1,847.22
Port St. Joe, Fla.	30.00	0	0	0	30.00
Providence, R. I.	430.00	0	0	0	430.00
Sabine, Tex.	1,225.00	0	370.00	0	1,595.00
San Diego (Point Loma), Calif.	1,395.00	0	1,320.00	0	2,715.00
San Francisco (Angel Island), Calif.	6,470.00	0	840.00	586.95	7,896.95
San Luis Obispo (Port San Luis), Calif.	1,060.00	0	120.00	0	1,180.00
Savannah, Ga.	795.00	0	110.00	272.63	1,177.63
Searsport, Maine	0	0	0	0	0
Seattle, Wash. ⁴	976.00	0	630.00	650.30	2,256.30
South Bend, Wash.	20.00	0	0	0	20.00
Tampa, Fla.	1,490.00	0	280.00	239.80	2,009.80
Vineyard Haven, Mass.	0	0	0	0	0
West Palm Beach, Fla.	10.00	0	0	0	10.00
Wilmington, N. C.	325.00	0	30.00	0	355.00
Total	109,829.00	310.00	26,948.00	28,033.66	165,125.66
Alaska:					
Ketchikan	0	0	0	0	0
Wrangell	0	0	0	0	0
Total	0	0	0	0	0
Hawaii:					
Ahukini	0	0	0	0	0
Hilo	40.00	0	0	0	40.00
Honolulu	4,851.00	0	180.00	0	5,031.00
Kahului	0	0	0	0	0
Lahaina	0	0	0	0	0
Makukona	0	0	0	0	0
Port Allen	0	0	0	0	0
Total	4,891.00	0	180.00	0	5,071.00

¹ Includes Plymouth, Mass.² Includes Harbor Island, Tex.³ Includes Perth Amboy, N. J.⁴ Includes all ports on Puget Sound.

TABLE 2.—*Statement of quarantine services rendered at maritime quarantine stations during the fiscal year 1941—Continued*

Station	Inspection services	Detention services	Special services	Fumigation services	Total charges
Puerto Rico:					
Aguadilla.....	\$15.00	0	0	0	\$15.00
Arecibo.....	0	0	0	0	0
Arroyo.....	10.00	0	0	0	10.00
Central Aguirre.....	10.00	0	0	0	10.00
Fajardo.....	5.00	0	0	0	5.00
Guanica.....	105.00	0	0	0	105.00
Humacao.....	35.00	0	0	0	35.00
Mayaguez.....	175.00	0	0	0	175.00
Ponce.....	305.00	0	0	0	305.00
San Juan.....	2,578.00	0	\$230.00	\$62.85	2,870.85
Total.....	3,238.00	0	230.00	62.85	3,530.85
Virgin Islands:					
Charlotte Amalie.....	6,557.00	0	260.00	34.64	6,851.64
Christiansted.....	50.00	0	0	0	50.00
Frederiksted.....	385.00	0	0	0	385.00
Total.....	6,992.00	0	260.00	34.64	7,286.64
Total, all stations.....	124,950.00	\$310.00	27,618.00	28,136.15	181,014.15

MEXICAN BORDER STATIONS

TABLE 3.—*Summary of quarantine transactions on the Mexican border for the fiscal year 1941*

Station	Number of persons from interior of Mexico inspected	Number of local persons inspected	Total number of persons inspected	Total number of persons disinfecting	Total number of persons passed without treatment	Total number of persons vaccinated	Total number of sick refused admission	Total pieces of baggage disinfected
Brownsville, Tex.....	8,545	741,269	749,814	0	746,992	2,822	0	0
Calxico, Calif.....	0	697	697	0	558	139	0	0
Columbus, N. Mex.....	380	563	943	0	642	299	2	0
El Rio, Tex.....	855	94,301	95,156	0	94,583	573	0	0
Douglas, Ariz.....	66	477	543	0	485	43	15	0
Eagle Pass, Tex.....	13,338	445,255	458,593	0	457,724	869	0	10
El Paso, Tex. ¹	9,245	6,122,083	6,131,328	0	6,127,812	3,516	0	78
Hidalgo, Tex.....	9,471	471,490	480,961	1	478,567	2,393	0	0
Laredo, Tex. ²	103,596	1,854,458	1,958,054	0	1,955,603	2,451	0	0
Naco, Ariz.....	15	2,043	2,058	0	1,922	136	0	0
Nogales, Ariz.....	4,678	12,287	16,965	169	16,089	707	0	0
Presidio, Tex.....	409	67,505	67,914	0	67,307	607	0	0
Rio Grande City, Tex.....	128	4,272	4,400	0	4,348	52	0	0
Roma, Tex.....	68	57,988	58,056	0	58,052	4	0	0
San Ysidro, Calif.....	1,776	4,225	6,001	0	5,651	350	0	0
Thayer (Mercedes), Tex.....	11	48,717	48,728	1	48,626	101	0	0
Zapata, Tex.....	0	11,684	11,684	0	11,583	101	0	0
Total.....	152,581	9,939,314	10,091,895	171	10,076,544	15,163	17	88

¹ Includes Fort Hancock, Guadalupe Gate, and Ysleta.² Includes Minera and San Ignacio.

TRANSACTIONS AT UNITED STATES AIRPORTS OF ENTRY FOR AIRPLANES FROM FOREIGN PORTS

TABLE 4.—Summary of transactions at continental and insular stations for the fiscal year 1941

Location	Name of airport	Distance in miles to nearest Public Health Service station	Date designated	Number of airplanes arriving from foreign ports	Number of airplanes inspected by Public Health Service	Number of persons arriving from foreign ports or places	Number of persons inspected by Public Health Service	Number of aliens inspected by Public Health Service	Number of aliens certified for diseases
Alo, Ariz.	Municipal Airport.	6	Nov. 15, 1929	0	0	0	0	0	0
Akron, Ohio ¹	do. ²		Apr. 8, 1929	51	51	1,068	1,068	154	1
Alameda, Calif. (San Francisco).	Alameda Seaplane Base ³								
Albany, N. Y.	Municipal Field	10	Sept. 28, 1928	41	41	937	937	101	1
Baltimore, Md.	Baltimore Airport ³	20	June 26, 1936						
Bangor, Maine.	Bangor Municipal Airport ³		Apr. 18, 1940	3	0	5	0	0	0
Bellingham, Wash.	Bellingham Airport ⁴	5	Jan. 8, 1930	930	930	9,498	9,498	1,564	7
Brownsville, Tex.	Municipal Airport.		June 10, 1929	181	0	084	0	0	0
Buffalo, N. Y.	(Buffalo Launch Club Seaplane Base ²)		Oct. 16, 1940						
Burlington, Vt. ¹	Burlington Municipal Airport ²		June 29, 1934	0	0	0	0	0	0
Calexico, Calif.	Calexico Municipal Airport ²		Jan. 10, 1933	0	0	0	0	0	0
Cape Vincent, N. Y.	Cape Vincent Harbor ²		Apr. 25, 1934	0	0	0	0	0	0
Caribou, Maine ¹	Caribou Municipal Airport		Oct. 31, 1932	56	56	616	616	93	0
Charlotte, Amalie, V. I.	Pan American Airways Base ³		Sept. 23, 1932	0	0	0	0	0	0
Cleveland, Ohio.	Cleveland Municipal Airport		June 19, 1931	134	0	390	0	0	0
Detroit, Mich.	(Detroit Municipal Airport)	5	Aug. 1, 1929						
	(Wayne County Airport.)	15	Feb. 10, 1931						
Douglas, Ariz.	Douglas Airport.		Jan. 8, 1930	0	0	0	0	0	0
Duluth, Minn.	(Duluth Municipal Airport.)		Sept. 4, 1931	0	0	0	0	0	0
	(Duluth Boat Club Seaplane Base.)		do.	0	0	0	0	0	0
Eagle Pass, Tex.	Eagle Pass Airport.	11½	Mar. 5, 1930	1	1	1	1	0	0
El Paso, Tex.	Municipal Airport.	9	Aug. 23, 1932	11	11	33	33	27	0
Fairbanks, Alaska ¹	Weeks Municipal Airfield		Apr. 1, 1935						
Fort Yukon, Alaska ¹	Fort Yukon Airfield ²		July 6, 1938	206	206	2,877	2,877	0	0
Glendale, Calif. (Los Angeles).	Grand Central Air Terminal ²	12							
Great Falls, Mont. ¹	Great Falls Municipal Airport ²		June 2, 1930	0	0	0	0	0	0
Hayre, Mont.	Hayre Municipal Airport ²		do.						

¹ No medical officer of Public Health Service on duty.² Temporary permission.³ Authorized for use but not officially designated.⁴ Abandoned Apr. 17, 1941.

TABLE 4.—Summary of transactions at continental and insular stations for the fiscal year 1941—Continued

Location	Name of airport	Distance in miles to nearest Public Health Service station	Date designated	Number of airplanes arriving from foreign ports	Number of airplanes inspected by Public Health Service	Number of persons arriving from foreign ports or places	Number of persons inspected by Public Health Service	Number of aliens inspected by Public Health Service	Number of aliens certified for diseases
Boulton, Maine	Boulton Municipal Airport ²		Oct. 7, 1940	0	0	0	0	0	0
Honolulu, T. H.	Honolulu Airport ³			75	75	2,384	2,384	149	1
Juneau, Alaska	Juneau Airport	8	June 18, 1940	0	0	0	0	0	0
Ketchikan, Alaska	Ketchikan Airport		do	0	0	0	0	0	0
Key West, Fla.	Meadham Field	4	Dec. 20, 1927	0	0	0	0	0	0
Laredo, Tex.	Naval Air Base ³	3½	Jan. 24, 1930	15	15	136	136	0	0
Malone, N. Y.	Laredo Airfield		Apr. 18, 1930	25	25	96	96	0	0
Miami, Fla.	Malone Airfield	14	Oct. 16, 1928	3	0	6	0	0	0
New Orleans, La.	Pan American Field (34th St.)	11	Mar. 7, 1930	2,118	678	54,024	13,813	6,993	254
New York, N. Y.	Dinner Key Seaplane Base		Sept. 17, 1937	5	4	39	33	2	0
Niagara Falls, N. Y.	Charles F. Young Service Airport ²			153	153	4,950	4,950	1,247	34
Nogales, Ariz.	Port Washington Seaplane Base ³			14	13	0	20	0	0
Ogdensburg, N. Y.	LaGuardia Field ²	7	July 2, 1938	7	7	0	18	1	0
Pembina, N. Dak.	Nogales Municipal Airport		June 27, 1929	3	0	0	0	0	0
Port Antonio, Wash.	Ogdensburg Harbor	5	Mar. 1, 1932	0	0	0	0	0	0
Port Townsend, Wash.	Fort Pembina Airport		Feb. 2, 1930	0	0	61	0	0	0
Put-in-Bay, Ohio	Port Antonio	6	Jan. 8, 1930	0	0	0	0	0	0
Rochester, N. Y.	Put-in-Bay Airport		June 18, 1930	0	0	0	0	0	0
Rouses Point, N. Y.	Rochester Municipal Airport		Mar. 12, 1934	0	0	8,310	0	0	0
San Diego, Calif.	Rouses Point Seaplane Base	6	Nov. 7, 1936	0	0	720	0	0	0
Sandusky, Ohio	San Diego Municipal Airport		July 14, 1932	19	2	0	11	5	0
San Juan, P. R.	John G. Hinde Airport ²		Jan. 24, 1930	0	0	0	0	0	0
San Pedro, Calif.	Isla Grande Airport		June 1, 1937	529	527	8	8,294	463	2
Sault Ste. Marie, Mich.	Cabrillo Beach Seaplane Base ³		Jan. 19, 1929	27	27	221	720	157	0
Seattle, Wash.	Sault Ste. Marie Airport ²		Aug. 4, 1933	0	0	0	0	0	0
Skagway, Alaska	(Boeing Municipal Air Field)		Sept. 11, 1928	1,536	0	9,248	0	0	0
Spokane, Wash.	Lake Union		Dec. 27, 1928						
Swanton, Vt.	Skagway Municipal Airport		Nov. 30, 1931						
Tampa, Fla.	Spokane Municipal Airport		June 2, 1931						
Watertown, N. Y.	Missisquoi Airport		July 18, 1930	2	2	7	7	0	0
Wells Island, N. Y.	Municipal Airport		Sept. 2, 1937						
	Watertown Municipal Airport ²		June 2, 1930						
	Wells Farms Airport ²		May 1, 1938						
	Wells Island Seaplane Base ²		do						

	Mar. 10, 1931	97	20	472	111	76	0
	Nov. 30, 1931	0	0	0	6	0	0
West Palm Beach, Fla.							
Wrangell, Alaska							
Total		6,242	2,844	96,610	45,653	11,032	302
Philippine Islands							
		111	111	2,523	2,523	0	0
		14	14	145	145	22	0
		12	12	117	117	0	0
Total		137	137	2,785	2,785	22	0

¹ No medical officer of Public Health Service on duty.

² Temporary permission.

³ Authorized for use but not officially designated.

⁴ Authorized for use by the Philippine Government.

⁵ Work performed by United States officers on duty in Philippine Islands.

⁶ Report covers 6-month period. Beginning Jan. 1, 1941, examination of aliens conducted by Commonwealth Government in accordance with Philippine Immigration Act of 1940.

CANAL ZONE

TABLE 5.—*Quarantine activities of the Government of the Canal Zone during the fiscal year 1941*¹

Activities	Number	Activities	Number
Vessels inspected and passed	5,853	Vessels detained in quarantine	0
Vessels granted pratique by radio	165	Crew detained on board ship for quarantine	0
Total	6,018	Immigration cases admitted to station	1,792
Crew passed at quarantine	287,640	Number of detention days	20,000
Crew passed by radio	42,873	Persons held for investigation and released	815
Passengers passed at quarantine	113,534	Persons deported under immigration laws	2,369
Passengers passed by radio	2,332	Supplementary inspection of vessels	4,087
Total	446,679	Vessels fumigated	42
Airplanes inspected and passed	1,154	Boxcars fumigated	108
Crew of airplanes inspected and passed	5,021	Number of "special demand" night boardings	59
Passengers of airplanes inspected and passed	10,799		
Total	15,820		

¹ Surg. G. J. Van Beeck, U. S. Public Health Service, detailed as chief quarantine officer.

MEDICAL INSPECTION OF ALIENS

TABLE 6.—*Alien passengers and seamen inspected and certified at maritime ports in the United States and possessions during the fiscal year 1941*

Place	Number of alien passengers examined	Alien passengers certified ¹					Number of alien seamen examined	Alien seamen certified ¹				
		Class A		Class B	Class C	Total		Class A		Class B	Class C	Total
		I	II					I	II			
ATLANTIC COAST												
Baltimore, Md.	419	0	0	34	0	34	20,427	1	118	63	10	192
Boston, Mass.	2,205	2	6	249	108	365	24,636	3	135	21	9	168
Brunswick, Ga.	0	0	0	0	0	0	0	0	0	0	0	0
Charleston, S. C.	14	0	0	0	0	0	2,775	0	4	0	0	4
Fall River, Mass.	3	0	0	0	0	0	1	0	0	0	0	0
Fernandina (Cumberland Sound), Fla.	0	0	0	0	0	0	32	0	0	0	0	0
Fort Lauderdale (Port Everglades), Fla.	5	0	0	0	0	0	699	7	0	0	0	7
Fort Monroe, Va. ²	255	0	0	6	0	6	13,276	1	31	97	6	135
Fort Pierce, Fla.	1	0	0	0	0	0	0	0	0	0	0	0
Georgetown, S. C.	0	0	0	0	0	0	37	0	0	0	0	0
Gloucester, Mass.	0	0	0	0	0	0	509	0	0	0	0	0
Jacksonville, Fla.	20	0	0	0	0	0	3,454	0	5	0	0	0
Key West, Fla.	1,631	0	0	37	0	37	201	0	0	0	0	5
Miami, Fla.	15,794	8	3	457	1	469	7,028	2	3	1	0	6
Morehead City, N. C.	0	0	0	0	0	0	131	0	0	0	0	0
New Bedford, Mass.	27	0	0	0	0	0	26	0	0	2	1	3
New London, Conn.	0	0	0	0	0	0	0	0	0	0	0	0
Newport, R. I.	0	0	0	0	0	0	0	0	0	0	0	0
Newport, Vt.	446	3	1	13	145	162	0	0	0	0	0	0
New York, N. Y.	54,450	37	30	4,776	12	4,855	182,570	6	823	53	125	1,007
Perth Amboy, N. J.	0	0	0	0	0	0	1,694	0	9	0	0	9
Philadelphia, Pa. ³	287	0	0	0	0	0	23,065	0	249	10	18	277
Portland, Maine	14	0	0	0	0	0	1,492	0	6	3	0	9
Providence, R. I.	0	0	0	0	0	0	596	0	0	0	0	0
Savannah, Ga.	9	0	0	0	0	0	1,232	2	17	1	0	20
Searsport, Maine	0	0	0	0	0	0	0	0	0	0	0	0
Vineyard Haven, Mass.	0	0	0	0	0	0	6	0	0	0	0	0
Washington, N. C.	0	0	0	0	0	0	0	0	0	0	0	0
West Palm Beach, Fla.	14	0	0	0	0	0	348	0	0	0	0	0
Wilmington, N. C.	3	0	0	0	0	0	530	0	0	0	0	0
Total	75,597	50	40	5,572	266	5,928	284,765	22	1,400	251	169	1,842

¹ Class A-1: Aliens certified for idiocy, imbecility, feeble-mindedness, insanity, epilepsy, chronic alcoholism. Class A-11: Aliens certified for tuberculosis or other loathsome or dangerous contagious disease. Class B: Aliens certified for diseases or defects which affect ability to earn a living. Class C: Aliens certified for diseases or defects of less degree.

² Includes Norfolk, Va., and Newport News, Va.

³ Includes Gloucester, N. J., Lewes, Del., Marcus Hook, Pa.

TABLE 6.—*Alien passengers and seamen inspected and certified at maritime ports in the United States and possessions during the fiscal year 1941—Continued*

Place	Number of alien passengers examined	Alien passengers certified					Number of alien seamen examined	Alien seamen certified				
		Class A		Class B	Class C	Total		Class A		Class B	Class C	Total
		I	II					I	II			
GULF COAST												
Atchafalaya (Morgan City), La.....	0	0	0	0	0	0	0	0	0	0	0	0
Boca Grande, Fla.....	0	0	0	0	0	0	144	0	0	0	0	0
Brownsville, Tex.....	0	0	0	0	0	0	0	0	0	0	0	0
Carrabelle, Fla.....	0	0	0	0	0	0	113	0	0	0	0	0
Corpus Christi, Tex.....	0	0	0	0	0	0	441	0	0	0	0	0
Freeport, Tex.....	0	0	0	0	0	0	96	0	0	0	0	0
Galveston, Tex.....	25	0	0	0	0	0	12,286	0	69	1	70	70
Gulfport, Miss.....	0	0	0	0	0	0	222	0	0	0	0	0
Mobile, Ala.....	97	0	0	0	0	0	6,774	34	0	1	0	35
New Orleans, La.....	1,835	4	2	15	3	24	22,878	1	131	2	4	138
Panama City (St. Andrews Bay), Fla.....	0	0	0	0	0	0	0	0	0	0	0	0
Pascagoula, Miss.....	0	0	0	0	0	0	0	0	0	0	0	0
Pensacola, Fla.....	11	0	0	0	0	0	599	0	12	0	0	12
Port St. Joe, Fla.....	0	0	0	0	0	0	42	0	0	0	0	0
Sabine, Tex.....	3	0	0	0	0	0	3,675	0	56	4	3	63
Tampa, Fla.....	119	0	0	0	0	0	3,550	0	22	0	0	22
Total.....	2,090	4	2	15	3	24	50,820	35	290	8	7	340
PACIFIC COAST												
Aberdeen.....	0	0	0	0	0	0	137	0	0	0	0	0
Astoria, Oreg.....	0	0	0	0	0	0	390	0	0	0	0	0
Eureka, Calif.....	0	0	0	0	0	0	0	0	0	0	0	0
Fort Bragg, Calif.....	0	0	0	0	0	0	0	0	0	0	0	0
Los Angeles (Terminal Island), Calif.....	10,786	2	1	31	0	34	42,517	4	159	3	0	166
Marshfield (Coos Bay), Oreg.....	0	0	0	0	0	0	32	0	0	0	0	0
Monterey, Calif.....	220	0	0	0	0	0	2,820	1	13	0	0	14
Portland, Oreg.....	16	1	4	0	0	5	1,234	0	2	0	0	2
San Diego, Calif.....	0	0	0	0	0	0	0	0	0	0	0	0
San Francisco (Angel Island), Calif.....	7,114	2	5	198	12	217	18,327	1	32	5	3	41
San Luis Obispo, Calif.....	0	0	0	0	0	0	1,929	0	0	0	0	0
Santa Barbara, Calif.....	2,910	0	3	350	11	364	10,476	9	9	1	0	19
Seattle, Wash. ⁴	0	0	0	0	0	0	82	0	0	0	0	0
South Bend, Wash.....	0	0	0	0	0	0	0	0	0	0	0	0
Total.....	21,046	5	13	579	23	620	77,944	15	215	9	3	242
INSULAR												
Alaska:	0	0	0	0	0	0	0	0	0	0	0	0
Ketchikan.....	0	0	0	0	0	0	0	0	0	0	0	0
Hawaii:	2,905	1	8	16	3	28	12,864	1	12	15	0	28
Honolulu.....	0	0	0	0	0	0	0	0	0	0	0	0
Philippine Islands: ⁵	0	0	0	0	0	0	0	0	0	0	0	0
Appari.....	29	0	0	0	0	0	0	0	0	0	0	0
Davao.....	0	0	0	0	0	0	0	0	0	0	0	0
Iloilo.....	32	0	0	0	0	0	0	0	0	0	0	0
Jolo.....	0	0	0	0	0	0	0	0	0	0	0	0
Legaspi.....	10,734	0	36	16	1	53	3	0	0	0	0	0
Manila.....	0	0	0	0	0	0	0	0	0	0	0	0
Zamboanga.....	0	0	0	0	0	0	0	0	0	0	0	0
Total ¹	10,795	0	36	16	1	53	3	0	0	0	0	0
Puerto Rico:	0	0	0	0	0	0	2	0	0	0	0	0
Aguadilla.....	0	0	0	0	0	0	0	0	0	0	0	0
Arecibo.....	0	0	0	0	0	0	31	0	0	0	0	0
Arroyo.....	0	0	0	0	0	0	0	0	0	0	0	0
Central Aguirre (Jobos).....	1	0	0	0	0	0	5	0	0	0	0	0
Fajardo.....	3	0	0	0	0	0	218	0	0	0	0	0
Guanica.....	0	0	0	0	0	0	14	0	0	0	0	0
Humacao.....	0	0	0	0	0	0	228	0	0	0	0	0
Mayaguez.....	0	0	0	0	0	0	387	0	0	0	0	0
Ponce.....	1,840	0	0	8	0	8	4,299	0	3	0	0	3
San Juan.....	0	0	0	0	0	0	0	0	0	0	0	0
Total.....	1,844	0	0	8	0	8	5,184	0	3	0	0	3
Virgin Islands:	880	0	0	2	0	2	7,127	0	62	3	0	65
Charlotte Amalie.....	0	0	0	0	0	0	0	0	0	0	0	0
Total, all stations.....	115,157	60	99	6,208	296	6,663	438,707	73	1,982	286	179	2,520

⁴ Includes all ports on Puget Sound.⁵ Report covers 6-month period. Beginning Jan. 1, 1941, examination of aliens conducted by Commonwealth Government in accordance with Philippine Immigration Act of 1940.

TABLE 7.—*Aliens inspected and certified at international border stations during the fiscal year 1941*

Place	Number of persons making permanent entry examined	Number of persons making temporary entry examined	Number of other persons examined	Total number of persons examined	Aliens certified				
					Class A		Class B	Class C	Total
					I	II			
MEXICAN BORDER									
Ajo, Ariz.	0	0	72	72	0	0	0	0	0
Brownsville, Tex.	617	447	1,029	2,093	8	19	61	17	105
Calexico, Calif.	215	26	456	697	4	1	35	0	40
Columbus, N. Mex.	0	0	943	943	2	0	0	0	2
Del Rio, Tex.	58	0	28	86	0	4	4	1	9
Douglas, Ariz.	66	0	516	582	5	8	6	8	27
Eagle Pass, Tex.	232	0	21,398	21,630	5	0	10	6	21
El Paso, Tex. ¹	597	982	5,921	7,500	54	226	334	0	614
Hidalgo, Tex.	112	0	381	493	2	11	38	45	96
Laredo, Tex.	1,078	1,324	71,325	73,727	7	19	700	2	728
Naco, Ariz.	17	0	2,041	2,058	6	12	53	44	115
Nogales, Ariz.	723	1,505	11,831	14,059	5	60	446	96	607
Presidio, Tex.	11	66	912	989	2	0	24	0	26
Rio Grande City, Tex.	4	0	191	195	5	0	2	0	7
Roma, Tex.	4	0	1,248	1,252	0	10	32	72	114
San Ysidro, Calif.	1,431	950	3,620	6,001	8	12	86	0	106
Thayer (Mercedes), Tex.	0	0	126	126	0	2	5	23	30
Tucson, Ariz.	0	0	99	99	10	27	6	0	43
Zapata, Tex.	0	496	20	516	0	0	0	0	0
Total	5,165	5,796	122,157	133,118	123	411	1,842	314	2,690
CANADIAN BORDER									
Bellingham, Wash.	0	0	0	0	0	0	0	0	0
Blaine, Wash.	195	0	631	826	4	1	10	59	74
Buffalo, N. Y.	779	326	23	1,128	5	17	231	0	253
Calais, Maine	365	0	17	382	2	1	1	2	6
Chicago, Ill.	0	0	169	169	1	0	2	1	4
Cleveland, Ohio	0	0	0	0	0	0	0	0	0
Detroit, Mich.	954	765	222	1,941	25	8	197	0	230
Duluth, Minn.	1	0	137	138	0	0	0	0	0
Eastport, Idaho	192	90	256	538	7	0	65	21	93
Eastport, Maine	0	0	0	0	0	0	0	0	0
Fort Fairfield, Maine	15	23	35	73	0	2	0	52	54
Erie, Pa.	0	0	0	0	0	0	0	0	0
Halifax, N. S., Canada	1,154	2,195	30	3,379	2	3	460	343	808
Havre, Mont.	0	0	0	0	0	0	0	0	0
Houlton, Maine	498	1	12	511	0	0	0	0	0
International Falls, Minn.	100	28,273	42,514	70,887	0	0	0	0	0
Jackman, Maine	0	1	2	3	1	0	0	2	3
Malone, N. Y.	5	3	8	16	0	1	0	5	6
Montreal, Canada	1,392	0	0	1,392	29	0	132	2	163
Newport, Vt.	22	0	49	71	0	0	2	23	25
Niagara Falls, N. Y.	378	280	34	692	7	0	101	0	108
Northport, Wash.	2	4	10	16	0	0	0	0	0
Noyes, Minn.	0	0	113	113	19	0	22	66	107
Ogdensburg, N. Y.	7	4	0	11	0	0	0	0	0
Oroville, Wash.	0	27	0	27	0	0	0	0	0
Port Angeles, Wash.	0	0	0	0	0	0	0	0	0
Port Huron, Mich.	167	114	479	760	8	1	76	0	85
Quebec, Canada	1,448	1,538	20	3,006	2	0	312	97	411
Rochester, N. Y.	0	0	0	0	0	0	0	0	0
Rouses Point, N. Y.	136	79	14	229	7	3	16	2	28
St. Albans, Vt.	297	0	33	330	3	0	14	17	34
St. Johns, N. B., Canada	337	119	421	877	1	5	85	24	115
Sault Ste. Marie, Mich.	0	0	0	0	0	0	0	0	0
Sumas, Mont.	4	3	14	21	0	1	7	1	9
Sweetgrass, Mont.	12	0	19	31	2	1	2	1	6
Van Buren, Maine	25	0	0	25	0	0	0	2	2
Vanceboro, Maine	840	0	760	1,600	0	0	0	0	0
Vancouver, B. C., Canada	0	637	0	637	1	6	208	0	215
Victoria, B. C., Canada	183	73	0	256	5	0	58	37	100
Winnipeg, Man., Canada	2,194	202	3,024	5,420	9	5	909	52	975
Yarmouth, N. S., Canada	3	0	7	10	0	0	5	0	5
Total	11,705	34,757	49,053	95,515	140	55	2,915	809	3,919
Grand total	16,870	40,553	171,210	228,633	263	466	4,757	1,123	6,609

¹ Includes Fort Hancock, Guadalupe Gate, and Ysleta.

TABLE 8.—*Alien seamen inspected and certified at international border stations during fiscal year 1941*

Place	Number of alien seamen examined	Alien seamen certified				Total
		Class A		Class B	Class C	
		I	II			
Bellingham, Wash.....	51	0	0	0	0	0
Buffalo, N. Y. ¹	1,137	0	0	0	0	0
Chicago, Ill.....	530	0	5	22	4	31
Cleveland, Ohio.....	196	0	3	0	0	3
Detroit, Mich.....	21	0	0	0	0	0
Duluth, Minn.....	72	0	0	0	0	0
Eastport, Maine.....	0	0	0	0	0	0
Erie, Pa.....	429	0	0	0	0	0
Ogdensburg, N. Y.....	197	0	0	0	0	0
Port Angeles, Wash.....	611	0	0	0	0	0
Port Huron, Mich.....	56	0	0	3	0	3
Rochester, N. Y.....	2,898	0	0	0	0	0
St. John, New Brunswick.....	6	0	0	0	0	0
Sault Ste. Marie, Mich.....	0	0	0	0	0	0
Total.....	6,204	0	8	25	4	37

¹ Includes Niagara Falls, N. Y.TABLE 9.—*Applicants for immigration visas medically examined and certified during the fiscal year 1941*

Country and consular office	Total number of applicants examined	Number of applicants in each class			Number of applicants certified		
		Quota	Non-quota	Non-immigrants	Class A	Class B	Total
WESTERN HEMISPHERE							
Cuba: Habana	6, 155	4, 785	1, 370	0	19	750	769
Canada, total	20, 846	6, 484	13, 869	493	56	4, 067	4 123
Montreal	7, 696	3, 479	4, 144	73	20	1, 498	1, 518
Niagara Falls	1, 027	216	797	14	4	158	162
Quebec	342	34	308	0	2	61	63
Toronto	3, 284	1, 182	2, 098	4	8	784	792
Vancouver	2, 104	809	1, 295	0	4	96	100
Windsor	4, 815	676	4, 131	8	15	1, 197	1, 212
Winnipeg	1, 409	85	930	394	2	242	244
Yarmouth	169	3	166	0	1	31	32
All countries, Western Hemisphere	27, 001	11, 269	15, 239	493	75	4, 817	4, 892
EASTERN HEMISPHERE							
Europe, total	19, 255	18, 408	438	409	169	6, 981	7, 150
Belgium: Antwerp ¹	216	214	2	0	4	62	66
England, total	10, 293	10, 020	252	21	18	2, 661	2, 679
Liverpool ²	51	23	7	21	0	15	15
London	10, 242	9, 997	245	0	18	2, 646	2, 664
Germany, total	7, 507	7, 394	101	12	138	3, 975	4, 113
Berlin	2, 040	1, 981	47	12	7	1, 025	1, 032
Hamburg	1, 478	1, 471	7	0	3	201	204
Prague, Bohemia ³	32	24	8	0	1	7	8
Stuttgart	2, 465	2, 445	20	0	62	1, 624	1, 686
Vienna ⁴	1, 492	1, 473	19	0	65	1, 118	1, 183
Holland: Rotterdam	71	70	1	0	0	14	14
Ireland, Northern: Belfast	26	17	4	5	0	4	4
Irish Free State: Dublin	142	122	14	6	2	28	30
Italy: Rome ⁵	424	375	49	0	7	100	107
Scotland: Glasgow ⁶	576	196	15	365	0	137	137
Philippine Islands: Manila	516	153	363	0	2	71	73
All countries, Eastern Hemisphere	19, 771	18, 561	801	409	171	7, 052	7, 223
Western and Eastern Hemispheres	46, 772	29, 830	16, 040	902	246	11, 869	12, 115

¹ 6-month period. Resumed inspections January 1941.² 1 month.³ 4 months, July to October 1940.⁴ 4-month period. Resumed inspections March 1941.⁵ Consulate transferred from Naples Mar. 5, 1941.⁶ 10-month period.

DIVISION OF SANITARY REPORTS AND STATISTICS

Assistant Surgeon General E. R. COFFEY in charge

During the fiscal year, the Division was designated as the administrative unit responsible for the coordination of informational activities in the Public Health Service. The functions of the Division to act as an informational service and to produce and distribute health educational materials have been greatly expanded.

Surgeon Erval R. Coffey was appointed Assistant Surgeon General in charge on April 7, 1941, relieving Medical Director Charles V. Akin. Three new sections were established to carry out the program of production and distribution of health education and information materials.

The Division continued to collect and publish official reports on the prevalence of disease in the United States and in foreign countries; to edit and publish "Public Health Reports" and other publications; and to administer a program of Negro health education.

MORBIDITY AND MORTALITY REPORTS

UNITED STATES

Favorable health conditions, as indicated by both morbidity and mortality reports, continued in the United States during the calendar year 1940. Of the important communicable diseases, only influenza and poliomyelitis were above the 5-year median (1935-39). The minor epidemic of influenza, which began in the southern and western mountain States during the latter part of November 1939, reached the peak relatively early, around the first of February 1940. A much more severe epidemic began in California in November 1940, spread rapidly eastward across the southern section of the country, and reached the peak even earlier than in the preceding year—during the latter part of January 1941. The total number of cases of influenza during the calendar year 1940 was 57 percent above the 5-year median.

The incidence of poliomyelitis in the United States during 1940 was the highest since 1935. The disease was unusually prevalent throughout the North Central States and to a lesser extent in the Pacific Coast States. The New England and Middle Atlantic States reported relatively few cases during 1940.

The numbers of reported cases of diphtheria, smallpox, and typhoid fever for 1940 were the lowest on record, while the numbers of cases of measles, meningococcus meningitis, and scarlet fever were below the 5-year (1935-39) median.

Morbidity reports for the first half of 1941 showed a continuation of the influenza epidemic which began late in 1940, a sharp rise in the number of cases of poliomyelitis in June, the incipency of epi-

demic encephalitis in the West North Central States, and a high incidence of measles which indicated that 1941 would be a cyclic "measles year."

The accompanying tables show the numbers of reported cases of the principal notifiable diseases and the recorded deaths, with incidence and death rates, for these causes for 1940 as compared with 1938 and 1939.

Number of cases of certain communicable diseases and cases per 100,000 population in large groups of States in the United States during 1938, 1939, and 1940

Disease	Number of States ¹	Aggregate population (in thousands)			Cases			Cases per 100,000 population		
		1938	1939	1940	1938	1939	1940	1938	1939	1940
Chickenpox.....	46	117, 186	118, 186	119, 147	249, 829	222, 978	243, 000	213.2	188.7	203.9
Diphtheria.....	48	129, 823	130, 878	131, 892	30, 508	24, 053	15, 536	23.5	18.4	11.8
Influenza ²	48	129, 823	130, 878	131, 892	132, 954	277, 699	431, 472	102.4	212.2	327.1
Malaria ²	48	129, 823	130, 878	131, 892	84, 206	82, 655	78, 130	64.9	63.2	59.2
Measles.....	48	129, 823	130, 878	131, 892	822, 811	403, 317	291, 162	633.8	308.2	220.8
Meningitis, meningococcus ²	48	129, 823	130, 878	131, 892	2, 934	1, 994	1, 673	2.3	1.5	1.3
Mumps ²	42	97, 330	98, 180	98, 992	117, 328	111, 320	103, 901	120.5	113.4	105.0
Pellagra ²	47	116, 517	117, 473	118, 391	14, 774	10, 696	9, 229	12.7	9.1	7.8
Pneumonia (all forms) ²	48	129, 823	130, 878	131, 892	143, 997	147, 970	157, 512	110.9	113.1	119.4
Polioimyelitis.....	48	129, 823	130, 878	131, 892	1, 705	7, 343	9, 826	1.3	5.6	7.5
Scarlet fever.....	48	129, 823	130, 878	131, 892	189, 631	162, 897	155, 464	146.1	124.5	117.9
Smallpox.....	48	129, 823	130, 878	131, 892	14, 939	9, 877	2, 795	11.5	7.5	2.1
Tuberculosis (all forms) ²	48	129, 823	130, 878	131, 892	110, 223	107, 100	105, 757	84.9	81.8	80.2
Tuberculosis (respiratory system) ²	42	117, 319	118, 311	119, 263	76, 015	73, 938	72, 542	64.8	62.5	60.8
Typhoid and paratyphoid fever.....	48	129, 823	130, 878	131, 892	14, 903	13, 069	9, 809	11.5	10.0	7.4
Whooping cough.....	48	129, 823	130, 878	131, 892	227, 319	183, 188	183, 866	175.1	140.0	139.4

¹ In addition to the number of States given, the District of Columbia is also included.

² Includes the numbers of deaths used as cases in those States which report no cases, or in which States the number of reported cases is less than the number of deaths.

Number of deaths and deaths per 100,000 population from certain communicable diseases, with the number of cases reported for each death registered in large groups of States¹ in the United States during 1938, 1939, and 1940

Disease	Deaths			Deaths per 100,000 population			Cases reported for each death registered		
	1938	1939	1940	1938	1939	1940	1938	1939	1940
Chickenpox.....	96	95	84	0.1	0.1	0.1	2, 602	2, 347	2, 893
Diphtheria.....	2, 560	2, 022	1, 465	2.0	1.5	1.1	12	12	11
Influenza.....	16, 778	21, 920	20, 262	12.9	16.7	15.4	8	13	21
Malaria.....	2, 307	1, 750	1, 393	1.8	1.3	1.1	36	47	56
Measles.....	3, 227	1, 171	678	2.5	.9	.5	255	344	429
Meningitis, meningococcus.....	1, 106	718	607	.9	.5	.5	3	3	3
Mumps.....	56	74	99	.1	.1	.1	2, 095	1, 504	1, 050
Pellagra.....	3, 151	2, 421	2, 034	2.7	2.1	1.7	5	4	5
Pneumonia (all forms).....	87, 867	77, 939	71, 635	67.7	59.6	54.3	2	2	2
Polioimyelitis.....	478	756	1, 003	.4	.6	.8	4	10	10
Scarlet fever.....	1, 216	856	651	.9	.7	.5	156	190	239
Smallpox.....	46	39	15	(²)	(²)	(²)	325	253	186
Tuberculosis (all forms).....	63, 155	61, 458	60, 083	48.6	47.0	45.6	1.7	1.7	1.8
Tuberculosis (respiratory system).....	52, 018	50, 893	49, 929	44.3	43.0	41.9	1.5	1.5	1.5
Typhoid and paratyphoid fever.....	2, 397	2, 000	1, 437	1.8	1.5	1.1	6	7	7
Whooping cough.....	4, 729	3, 016	2, 869	3.6	2.3	2.2	48	61	64

¹ The same States as those for which cases are reported in the preceding table.

² Less than 0.1 per 100,000 population.

The crude death rate for the United States in 1940 was 10.8 per 1,000 population, a little less than 2 percent above the rate for 1939 (10.6); but since the rate in 1939 was the lowest recorded in the

history of the United States registration area, the rate for 1940 must be regarded as very favorable. The death rates for the expanding death registration area of the United States (all States since and including 1933), as recorded by the Bureau of the Census since 1900, are presented in the accompanying table.

Death rate (number per 1,000 population) for registration area, by years, 1900-1940

Year	Rate	Year	Rate	Year	Rate	Year	Rate
1940.....	10.8	1929.....	11.9	1918.....	18.1	1907.....	16.0
1939.....	10.6	1928.....	12.1	1917.....	14.3	1906.....	15.7
1938.....	10.7	1927.....	11.4	1916.....	14.0	1905.....	16.0
1937.....	11.3	1926.....	12.3	1915.....	13.6	1904.....	16.5
1936.....	11.6	1925.....	11.8	1914.....	13.6	1903.....	16.0
1935.....	11.0	1924.....	11.7	1913.....	14.1	1902.....	15.9
1934.....	11.1	1923.....	12.2	1912.....	13.9	1901.....	16.5
1933.....	10.7	1922.....	11.7	1911.....	14.2	1900.....	17.6
1932.....	10.9	1921.....	11.6	1910.....	15.0		
1931.....	11.1	1920.....	13.0	1909.....	14.4		
1930.....	11.4	1919.....	12.9	1908.....	14.8		

¹ Provisional.

Death rates from most of the acute communicable diseases were low. Only poliomyelitis and encephalitis recorded a larger number of deaths than in 1939. These two diseases, however, were relatively unimportant numerically as causes of death. Especially noteworthy were the low death rates from influenza and pneumonia, despite the epidemics of influenza. The number of fatal cases of pneumonia has declined rapidly since the use of serum and chemotherapy.

The four principal communicable diseases of childhood—diphtheria, measles, scarlet fever, and whooping cough—were responsible for about 25 percent fewer deaths in 1940 than in 1939. Other diseases causing a lower mortality in 1940 than in the preceding year were malaria, pellagra, digestive disorders, and diarrhea and enteritis.

During 1940, the maternal mortality rate declined for the eleventh consecutive year, while the infant mortality rate declined for the fourth consecutive year. In 1940 the maternal mortality rate was 3.6 per 100,000 population as compared to 3.8 in 1939, and the infant mortality rate was 47 per 1,000 live births as compared to 48 in 1939.

The important chronic diseases of adult life and old age (cancer, cerebral hemorrhage, diabetes, heart disease, and nephritis) accounted for a larger proportion of deaths in 1940 than in 1939.

Provisional mortality figures for the first quarter of 1941 indicate higher death rates than in 1940 for influenza, measles, encephalitis, whooping cough, tuberculosis, heart disease, diarrhea and enteritis, and automobile accidents. The number of deaths from influenza for this period was 35 percent greater than in either of the preceding two years, and the highest reported for the quarter since 1937. The death rate for measles for the period, 1.5 per 100,000 population, was the highest since 1938. The death rate from automobile accidents increased 22 percent and was the highest for the period since 1937. The death rate from other accidents was slightly less than for the corresponding quarter in 1940.

In spite of the influenza epidemic, the death rate for pneumonia for the first quarter decreased about 8 percent from the rate for the same period in 1940.

At the close of the fiscal year more than 5,000 collaborating and assistant collaborating epidemiologists in State and local health departments were serving the Federal Government, at a nominal remuneration, in the collection of morbidity data. Through this cooperative arrangement the Public Health Service continued to receive weekly, monthly, annual, and special reports on the incidence of disease throughout the United States.

FOREIGN COUNTRIES

War conditions have greatly curtailed the information regarding disease in European and Asiatic countries. Only meager and incomplete reports on the incidence of the quarantinable and other diseases in these countries were received during the past year. From many of these countries, no reports were received. Fragmentary reports, however, indicate that some of the quarantinable diseases reached epidemic proportions in certain foreign quarters.

An unusually high incidence of plague was reported during 1940 in Morocco, Egypt, and India. In the latter country the disease is always prevalent. Other countries which reported a significant incidence of plague are Algeria, Argentina, Brazil, China, Dutch East Indies, Ecuador, Madagascar, Peru, Thailand, Uganda, and the Union of South Africa. Cholera was especially prevalent in China and India, and a few cases of the disease were reported from Ceylon and Thailand. Yellow fever occurred in epidemic form during the latter part of 1940 in the Anglo-Egyptian Sudan, with approximately 8,000 cases and more than 800 deaths. Cases of yellow fever were also reported in Africa from the Belgian Congo, Gold Coast, Ivory Coast, Nigeria, French Sudan and Togo and in South America from Bolivia, Brazil, and Colombia. Typhus fever prevailed in Bulgaria, Germany, Rumania, Spain, and Turkey, and in Algeria, Belgian Congo, Bolivia, China, Egypt, Guatemala, and Peru. India, as usual, recorded the highest incidence of smallpox, and this disease was also prevalent during the year in Belgian Congo, Bolivia, China, Chosen, Colombia, Japan, Nigeria, Portugal, and Spain.

The accompanying table, in which the figures are, on the whole, very incomplete, at least gives some indication of the countries in which the quarantinable diseases were most prevalent during the calendar year 1940.

Country	Cases	Deaths	Country	Cases	Deaths
Cholera			Plague		
India	¹ 143,094	¹ 20,564	India	¹ 14,438	¹ 8,852
China		41,837	Morocco	1,099	
Indochina (French)	² 436	² 292	Madagascar	598	
Thailand	235	125	Egypt	409	
India (French)	³ 34	³ 16	Java and Madura		396
			Uganda		277
			Argentina	191	110
			Peru	184	70
			Thailand	115	43
			Ecuador	69	50
			Brazil	52	13
			Union of South Africa	37	
			Belgian Congo	26	26
			Algeria	23	

¹ January to Aug. 10, 1940.² February and March.³ January to April.

Country	Cases	Deaths	Country	Cases	Deaths
Smallpox			Typhus fever		
India.....	1154,740	1 34,909	Egypt.....	3,636	287
Belgian Congo.....	4,765	104	China.....	2,191	328
Nigeria.....	2,319	459	Algeria.....	2,146	-----
Colombia.....	1,990	42	Rumania.....	1,403	-----
Indochina (French).....	1,572	485	Peru.....	1,256	-----
Spain.....	1,090	80	Belgian Congo.....	1,210	111
China.....	981	-----	Bolivia.....	733	-----
Iraq.....	935	-----	Turkey.....	716	98
Chosen.....	720	149	Tunisia.....	651	-----
Sudan (Anglo Egyptian).....	535	44	Chile.....	430	69
Portugal.....	504	26	Yugoslavia.....	424	32
Japan.....	502	-----	Chosen.....	359	22
Bolivia.....	352	-----	Morocco.....	355	-----
Angola.....	271	-----	Guatemala.....	307	60
Southern Rhodesia.....	259	-----	Union of South Africa.....	299	71
Arabia.....	255	96	Iran.....	256	-----
Venezuela.....	224	-----	Germany.....	230	38
			Mexico.....	219	56
Yellow fever			Yellow fever		
Sudan (Anglo-Egyptian).....	8,000	800	Belgian Congo.....	1	-----
Brazil.....	-----	151	Bolivia.....	1	-----
Colombia.....	-----	35	Cameroon.....	10 1	10 1
Ivory Coast.....	6	1	French Equatorial Africa.....	10 1	10 1
Nigeria.....	2	1	Sudan (French).....	10 1	-----
Gold Coast.....	1	1	Togo (French).....	1	-----

¹ January to Aug. 10, 1940. ² February and March. ³ January to April. ⁴ January to September. ⁵ January to Mar. 16, 1940. ⁶ For 8 weeks. ⁷ January to June. ⁸ Approximately. ⁹ Includes 4 suspected cases. ¹⁰ Suspected.

PUBLICATIONS

During the fiscal year 1941, volume 55, part II, and volume 56, part I, of the Public Health Reports were issued, comprising 52 numbers and containing 2,569 pages of text and tabular matter, as compared to 2,330 pages in the fiscal year 1940 and 2,439 pages in 1939. Indexes were issued for parts I and II of the yearly volumes.

During the year, approximately 180 articles were published in the Public Health Reports covering the many fields in which the Public Health Service is engaged—scientific research, epidemiological investigations, health surveys, studies of health department procedure, industrial hygiene, quarantine procedures, mental hygiene, public health education, defense activities. Current statistics showing the prevalence of communicable diseases in the United States and of quarantinable and other diseases in foreign countries were published weekly for the information of health officers and others concerned with the protection of the public health.

An increasing number of articles was submitted for publication in the Public Health Reports during the year. Funds available for printing were insufficient to keep pace with the materials submitted, causing considerable delay in publication of many articles. At the end of the fiscal year a large amount of material was still on hand awaiting publication.

The Public Health Reports is sent each week to approximately 8,800 individuals and organizations, including 528 State health department employees, 995 county health officers, 1,097 city health department employees, 1,393 public libraries, 374 medical libraries, 226 members of staffs of medical and dental colleges, 478 public health nurses, 1,345

Public Health Service personnel, and many interested individuals in other Federal agencies and nonofficial organizations.

Reprints of 115 articles appearing in the Public Health Reports were issued during the fiscal year 1941 as compared with 90 during 1940 and 133 during 1939. Reprinting of articles permits more economical distribution to persons interested in particular subjects and permits the printing of sale copies by the Superintendent of Documents.

During the fiscal year two new supplements to the Public Health Reports were issued and an additional supplement, a two-volume study of the pharmacology of the opium alkaloids, was in preparation. New editions were issued of 5 supplements and two reprints previously published.

Hospital News, a multilithed collection of reports by personnel of the marine hospitals, was edited and issued semimonthly during the year. This publication is now in its eighth volume. Hospital News is distributed to approximately 1,200 medical and dental personnel of the Public Health Service.

NEGRO HEALTH WORK

The office of Negro Health Work continued to direct the National Negro Health Week and other educational activities, and to act as liaison to official and voluntary health agencies and related organizations.

The objective of the twenty-seventh observance of the National Negro Health Week was, "Personal Hygiene and First Aid Preparedness," in connection with the national defense program. The effectiveness is evident in reports of sanitary, educational, and clinical activities from 6,837 communities, urban and rural, in 36 States and Territories. The total number of persons participating was 4,202,190. Of these, 3,302,000 attended 13,635 lectures, 7,223 sermons, and daily group conferences; visual education was provided for 210,115 persons by motion pictures and for 150,600 visitors at health exhibits; school and various civic agencies of the communities sponsored plays, pageants, games, and other events that included 362,750 participants and spectators; 740 radio messages reached every section of the country.

Medical and dental examinations and treatments were given in 2,600 clinics which registered 175,200 individuals.

Clean-up, insect and rodent eradication, outhouse repairs and replacements, and home and lot improvements were carried out by 175,000 families; 501,600 selected health publications were made available, and 4,015 newspaper editorials and articles were published.

The quarterly bulletin, National Negro Health News, was distributed to 3,500 professional and lay workers in the fields of health, education, agriculture, industry, and social welfare.

A Negro Health Work Exhibit was displayed at the American Negro Exposition in Chicago, Ill. The Public Health Service also participated in the health demonstration conducted at the North Carolina College for Negroes, under the auspices of the North Carolina School Health Coordinating Service.

The increased activity of the office of Negro Health Work is due in large measure to the growing health consciousness of the Negro

people, the interest of many persons and agencies, colored and white, and to the efforts of many professional Negro men and women.

PREPARATION AND DISTRIBUTION OF HEALTH EDUCATION MATERIALS

This function of the Division has taken on increased significance during the fiscal year. The national defense program has focused attention sharply on the importance of community and individual health; more than ever it is recognized that emergency health needs cannot be met without the support of an enlightened citizenship. Demands upon the Public Health Service for materials that are at once authoritative and appropriate to the needs of the lay public have correspondingly increased.

In November 1940 the technical staff of the Division, experienced in the preparation of such materials, was reorganized in three collaborating sections. These sections are responsible for the planning, production, and distribution of printed materials, posters, exhibits, other graphic materials, radio programs, and motion pictures.

EDITORIAL SECTION

In the 7 months since November 1940, the Editorial Section completed approximately 150 writing assignments. These included articles, pamphlets, radio talks, summaries of conferences, addresses, and news releases. The Section has also provided editorial services in the review and revision of many articles on health subjects prepared by other Divisions of the Service and by outside agencies. Consultation on the selection of appropriate health education materials has been given to many official and nonofficial organizations. This Section also cooperated with the National Advisory Nutrition Committee in providing informational services for the National Nutrition Conference.

An important function of the Section has been to develop with the Division of Industrial Hygiene and the Division of Venereal Diseases their programs for the production of health education materials. These materials are designed to interpret technical information for the general public in such a way as to secure their active interest in individual and community health problems. Three new publications were prepared for the Division of Venereal Diseases and four previously published folders were rewritten. Review and editing of other venereal disease education materials was provided. One of the new manuscripts, not yet published, was a pamphlet on syphilis for adults of very limited reading ability.

The Workers' Health Series was planned to provide brief illustrated leaflets for industrial workers on important causes of disability. The topics selected for the series include both the major causes of nonindustrial sickness and the major occupational diseases. The first two of the series were released in February 1941, and three others had been completed at the close of the fiscal year. An illustrated folder on community health problems in defense areas was prepared for the States Relations Division.

An adaptation of the Gray-Leary method of testing the relative reading difficulty of printed materials for adults was developed and has been applied to all health education materials prepared in the Section. This has proved a useful yardstick for measuring the suitability of the copy for potential readers. Application of this test to a

number of pamphlets produced by various types of agencies indicates that health education materials are lacking in the desired qualities of good writing, as well as in the requirements for interpreting technical information to the public.

In February 1941, preparation of news releases and contact with the press was transferred to the Section. A total of 84 news releases was prepared and mimeographed for release during the fiscal year 1941. Releases are distributed to 600 national press correspondents, special writers, and press associations. In addition the Section has cooperated with various journals and newspapers in the preparation of feature stories on the work of the Public Health Service.

A new edition of the Annotated List of Publications of the Public Health Service for adult study groups and teachers was prepared, bringing the selected references up to date for the fiscal year 1941. A list of Current References on Health and National Defense was compiled and mimeographed for distribution to the public. The list of contributions of Public Health Service personnel published in outside journals was compiled in this section. The reprint and pamphlet files acquired 1,500 new items during the year.

In addition, the Section has handled approximately 500 written requests and many times that number of telephone requests for information on activities of the Public Health Service, and for special information on authoritative source materials. The requests for source materials handled by this Section are those which cannot be answered satisfactorily by distribution of Public Health Service materials and in most cases require the preparation of a list of references from other sources.

GRAPHICS SECTION

The Graphics Section is responsible for the design, layout, and art work of publications; the production of posters; the design and construction of exhibits; the production of specialized motion pictures; and the maintenance of the photographic service.

Publications.—Design, layout, and art work for 12 publications were completed during the fiscal year. These include:

Can You Afford Not To . . . (Promotional folder featuring venereal disease information.)

Directory of Venereal Disease Clinics. Supplement No. 4 to Venereal Disease Information.

The Doctor Says . . . Venereal Disease Folder No. 4.

Venereal Disease and National Defense. Venereal Disease Folder No. 7.

Until the Doctor Comes. Miscellaneous Publication No. 21 (Revised).

Wake Up Main Street. Community Health Folder No. 1.

But Flu Is Tougher. Workers' Health Series No. 1.

Leonard's Appendix and How It Burst. Workers' Health Series No. 2.

KO by CO Gas. Workers' Health Series No. 3.

Clara Gives Benzol the Run Around. Workers' Health Series No. 4.

Syphilis, Its Cause, Its Spread, Its Cure. Venereal Disease Folder No. 1 (Revised).

You Can End This Sorrow. Venereal Disease Folder No. 3 (Revised).

The Section is also responsible for the layout, design, and art work for the multilithed "Venereal Disease Education Circulars."

Posters.—Design, layout, and reproduction art work for six new posters was accomplished. These include:

Syphilis, Treated and Untreated Mothers. Venereal Disease Poster No. 12.
Know for Sure—Get a Blood Test for Syphilis. Venereal Disease Poster No. 13.

Make Our Men as Fit as Our Machines. Venereal Disease Poster No. 14.
No Home Remedy Ever Cured Gonorrhea. Venereal Disease Poster No. 15.
Prostitution Spreads Syphilis and Gonorrhea. Venereal Disease Poster No. 16.
No Home Remedy or Quack Ever Cured Syphilis or Gonorrhea (Revised).
Venereal Disease Poster No. 7.

Rough designs and layout on two posters were prepared for presentation to communities particularly concerned with the problem of case-holding in venereal disease control.

Exhibits.—Nine new exhibits were produced for the Division of Venereal Diseases, the National Cancer Institute, the Division of Sanitary Reports and Statistics, Division of Domestic Quarantine, and the Division of Mental Hygiene. The exhibits were on the following subjects:

Negro Health Work.—National Negro Health Movement and Community Cooperation (2 folding panels).
The Work of the National Cancer Institute.
Facilities for the Care and Treatment of Mental Patients—1941.
Institutional Facilities for the Mentally Deficient.
Syphilis—Massive Dose Therapy.
Venereal Disease and National Defense.
Dental Activities of the United States Public Health Service (2 folding panels).
Endemic Dental Fluorosis and Dental Caries.
Economic Status and Dental Caries.

These exhibits were designed for initial use at major health and welfare meetings, such as the American Negro Exposition, American Association for the Advancement of Science, American Psychiatric Association, American Association of Mental Deficiency, American Medical Association, American Social Hygiene Association, and the American Dental Association.

Although Public Health Service exhibits are designed primarily for major health meetings, a standard, portable form of presentation has been adopted to replace the large, complex type of exhibit which requires a representative from the Service to install. As a result, Public Health Service exhibits have been used with increasing frequency at State health meetings, as well as at meetings of various organizations and societies interested in health as a sociological problem of major importance.

The exhibits are limited in number and subject matter. In spite of this, distribution during the fiscal year 1941 approximated 100 exhibit displays furnished by the Service. Many requests were turned down owing to lack of suitable exhibits.

Photographs.—During the fiscal year, a total of 1,339 photographs was furnished by the Graphics Section photographic file. This number represents an increase of approximately 66 percent over the 806 pictures supplied during the previous fiscal year.

The wide variety of publications for which these photographs were furnished indicates a steadily growing demand for more illustrative materials in all types of periodicals, textbooks, journals, and newspapers. Periodicals requesting pictures included an excellent representation of the popular magazines, medical and scientific journals, news magazines, women's magazines, health journals, and educational publications. Book publishers, especially those specializing in the publication of sociology and biology textbooks for use in high schools and colleges, are frequently supplied with photographs.

Extensive use of Public Health Service photographs has been found in exhibits sponsored by civic groups, educators, nurses' training schools, and high schools.

A group of photographs was furnished for a Spanish version of the "Work of the Public Health Service" published by the State Department for distribution in South America.

Newspapers are currently demanding illustrations of sanitation, malaria control, industrial hygiene, and medical research for use in articles correlating Public Health Service activities with national defense.

Some 200 new pictures were added to the files during the year. These included a series of 60 photographs on Negro health work in Louisville, Ky., 63 photographs of the various clinics at the Southwest Health Center, in Washington, D. C., and a group of pictures showing the uses of Public Health Service posters and pamphlets in railroad stations, Y. M. C. A.'s, streetcars, and in other public places. Numerous pictures of Public Health Service officers and miscellaneous pictures borrowed from other agencies were added to the files as they were received.

Improvements in the organization of the legal release file and accumulated scrapbook material showing the uses of the pictures in publications have been accomplished, and a complete subject-index of the file was started.

Motion pictures.—Titles, subtitles, charts, and graphs were designed and executed for two Public Health Service motion pictures, "Rocky Mountain Spotted Fever" and a professional teaching film on syphilis. In addition, the scenarios of two specialized venereal disease control films were developed and the Section was administratively responsible for production of these motion pictures, which are now in production.

Consultation services.—Consultant service, as well as actual production in design and layout of visual education media, for State and local health agencies is a function of the Graphics Section.

"Arm Against Syphilis," a folder on venereal disease, was prepared in mat form for production by State and local health authorities. The folder was distributed by those authorities to registrants and candidates for training under the Selective Service Act.

For the State and Territorial Health Officers Conference in Washington, a display of visual education materials was exhibited. This display suggested visual materials which might be employed in community programs where special local problems existed. The display further emphasized the fact that the Public Health Service offered consultation and design and layout facilities for those communities desiring to produce materials on problems peculiarly local in character.

The Cooperative Project with the City of New York was continued during the fiscal year 1941.

The District of Columbia Department of Health requested assistance in the design and layout of a car-card for use in connection with the venereal disease control program. The design for this card is being made available to all State and local health authorities.

HEALTH EDUCATION PROMOTION

The work of the Health Education Promotion Section included preparation of radio programs, production and distribution of motion pictures, promotion and distribution of publications, and, until February 1941, the preparation of press releases.

In cooperation with the Office of Education the radio series "Help Yourself to Health" was electrically transcribed. Six programs—one on cancer, three on venereal diseases, one on vacation hazards, and one on general health—were prepared. This series of transcriptions was used by 215 radio stations throughout the country. In addition to the "Help Yourself to Health" series, two venereal disease control transcriptions entitled "The Story of a Young Man" and "The Story of Your Town" were prepared. These were used by 157 radio stations.

A motion picture, "Proof of the Pudding," was produced by Paramount Pictures, Inc., for the Metropolitan Life Insurance Co. in cooperation with the Public Health Service. This film was released on February 7, 1941. The Metropolitan Life Insurance Co. paid the entire cost of the film, which amounted to \$16,000. By enlisting the cooperation of State and local health officers and by arranging special screenings for interested groups, the Service is assisting in securing showings of this film to commercial theater audiences throughout the country.

Work has been started on three teaching films on syphilis, a general film dealing with Public Health Service activities and State cooperation in the field of industrial hygiene, and a film in two editions (one designed primarily for national defense purposes) on the subject of dental health.

A color film showing the life cycle of the tick and the work of the Rocky Mountain Spotted Fever Laboratory at Hamilton, Mont., has been cut and edited with new titles added and the film has been distributed to interested medical and public health groups.

DIVISION OF MARINE HOSPITALS AND RELIEF

Assistant Surgeon General R. P. SANDIDGE in charge

The fiscal year ending June 30, 1941, was one of increased activity throughout the Division. This is thought to be accounted for by a number of circumstances, notably by increased shipping as well as by other events connected directly or indirectly with the national defense program, in the development of which the Division of Marine Hospitals and Relief was privileged to contribute in a number of ways.

At certain marine hospitals special examinations of men referred by examining physicians of local Selective Service boards have been authorized and in a few instances hospitalization has been furnished Army personnel in certain areas pending completion of Army hospital facilities. All marine hospitals have been notified that selectees on authorized furlough may be accepted for treatment and advantage has been taken of this privilege by Army personnel visiting their homes in cities having marine hospitals.

The number of physical examinations made of applicants for enlistment in the United States Coast Guard increased greatly during the year. This work alone reached such proportions that it became necessary and desirable to appoint local physicians at strategic points throughout the country as special acting assistant surgeons for the purpose of conducting these examinations.

A situation without precedent confronted the Hospital Division when request was made for furnishing medical relief to detainees from certain foreign vessels seized by the United States. Emergency medical relief was rendered these detained alien seamen and special examinations were authorized in some cases. In April of this year, the crew from the scuttled German liner *Columbus* was transferred from the Immigration Station at Terminal Island, California, to an abandoned Civilian Conservation Corps camp on the marine hospital reservation at Fort Stanton, N. Mex. Medical and dental officers at this station are available for emergency relief as well as for consultation and advice in the matter of camp hygiene and sanitation.

In the field of research the Division was as active as in recent years but was engaged in no new problems of major importance. Studies in arthritis and psoriasis have been continued as well as the study of the physiology of histamine. Certain malarial studies were begun during the latter part of the year.

At the Leprosarium at Carville, La., a number of new experimental studies relating to treatment were carried on. A group of patients was carefully treated with sulfanilamide over a period sufficiently long for certain conclusions to be drawn. It was definitely shown that this particular drug had no direct effect on leprosy itself but was of some assistance in clearing up secondary infections. Studies are now in progress with promin, a more recent sulfonamide compound, but no definite tangible results had been noted at the close of the year. Alfon, a concentrated solution of vitamin A, was found to be in no way superior to chaulmoogra oil, and attempts to duplicate the favorable results claimed by others in the treatment of leprosy with diphtheria toxoid were unsuccessful.

In-patient activity and average per diem cost of in-patient relief at United States Marine Hospitals, fiscal year 1941

Hospital	Activity					Cost per in-patient day			
	Total num-ber in-pa-tients treated in hospital	Total in-patient re-lief days	Daily av-erage in-patient load	Average number days in-dis-charged pa-tient	Turnover rate ¹	Death rate per 1,000 in-patients	Gross per diem cost	Operating credits	Net per diem costs
General hospitals:									
Baltimore, Md.	6,661	154,327	422.8	23.7	15.4	34.7	\$3.89	\$0.06	\$3.83
Boston, Mass.	3,785	94,455	258.8	21.2	17.2	14.3	5.96	.05	5.91
Buffalo, N. Y.	8,583	21,469	258.8	27.8	13.1	24.5	5.25	.16	5.09
Chicago, Ill.	2,631	67,840	185.9	27.9	13.1	10.6	4.95	.03	4.92
Cleveland, Ohio	2,598	73,058	200.1	34.1	10.7	36.2	4.84	.05	4.79
Detroit, Mich.	3,022	98,071	268.7	32.5	11.2	38.7	4.07	.07	4.00
Ellis Island, N. Y.	3,699	131,422	360.1	48.1	7.6	15.2	4.23	.02	4.21
Evansville, Ind.	1,262	23,609	64.7	20.7	16.9	17.4	3.80	.04	3.76
Galveston, Tex.	2,746	60,915	166.9	20.7	17.6	13.8	4.39	.04	4.35
Key West, Fla.	896	13,718	37.6	14.6	25.0	32.4	5.52	.04	5.48
Kirkwood, Mo.	1,606	43,805	120.0	27.0	13.5	8.1	4.16	.17	3.99
Louisville, Ky.	2,015	38,594	105.7	18.9	19.3	26.3	4.37	.07	4.30
Memphis, Tenn.	1,986	34,647	94.9	18.1	20.2	3.5	5.16	.03	5.13
Mobile, Ala.	2,130	51,666	141.6	27.2	13.4	17.4	3.76	.11	3.65
New Orleans, La.	6,062	152,176	416.9	28.3	12.9	20.3	4.00	.07	3.93
Norfolk, Va.	4,664	113,111	309.9	20.5	17.8	18.7	3.70	.07	3.63
Pittsburgh, Pa.	1,189	23,788	65.2	20.8	17.6	6.7	4.57	.01	4.56
Portland, Maine	685	19,857	54.4	23.6	15.5	14.6	5.46	.16	5.30
San Francisco, Calif.	5,671	158,411	434.0	23.5	15.5	21.5	3.85	.04	3.81
Savannah, Ga.	1,937	61,700	169.0	42.4	8.6	23.2	3.38	.00	3.38
Seattle, Wash.	4,132	117,027	320.6	29.7	12.3	37.3	4.19	.12	4.07
Staten Island, N. Y.	9,438	224,596	615.3	25.6	14.3	15.8	4.72	.05	4.67
Vineyard Haven, Mass.	119	5,317	14.6	22.5	16.2	33.6	4.46	.03	4.43
Totals or averages	69,192	1,783,580	4,886.5	26.4	13.8	21.6	4.33	.06	4.27
Total cost								\$7,607,053.51	
Tuberculosis sanatorium:									
Fort Stanton, N. Mex.	381	56,924	156.0	331.4	1.1	52.5	4.53	.13	4.40
Total cost								\$250,544.90	
Leprosarium:									
Carville, La.	436	137,070	375.5	2,055.3	.2	89.5	3.71	.08	3.63
Total cost								\$497,502.52	
All hospitals:									
Totals or averages	70,009	1,977,574	5,418.0	29.4	12.4	22.2	4.29	0.6	4.23
Total cost								\$8,355,100.93	

¹ Based on average daily load, i. e., 365 days÷average number days per discharged patient.² No in-patient department at this station.



General view of U. S. Marine Hospital (National Leprosarium), Carville, La. Double set of newly constructed patients' cottages of 30 bed rooms each, on right. Recreation building, front row, left. Area in left rear includes new nurses' home, personnel and colony dining rooms, laundries, administration building, vocational building, and storehouse.

Unsettled conditions existing throughout the year resulted in an unusual number of changes in practically all classes of personnel. The number of vacancies occurring by reason of resignation and transfer was considerably greater than under normal conditions and the loss occasioned by call of personnel to active military service created additional difficulties. The turnover volume in personnel in 1941 was 1,187 as compared with 765 in 1940, an increase of slightly over 55 percent. Owing to the fact that remuneration in other departments is often in excess of that offered for comparable duties by this Service and because of the rapidly increasing scarcity of unemployed qualified personnel, vacancies are becoming more and more difficult to fill.

Effort is being made continually to improve the personnel situation and to correct as far as possible any inequalities in employment which may exist. As an aid to this end plans have been made for allowing employees not assigned to quarters but who receive subsistence in kind as a part of their pay the privilege of payment in cash for all but one meal per day.

In spite of the turnover in personnel and other handicaps the record of accomplishments by and within the Division during the year compares favorably with that of any previous year. The total number of sick and disabled patients furnished relief was 511,023. Of these, 433,706 were treated as out-patients and 77,317 as in-patients. Of the latter, 31,013, or 40.1 percent, were American merchant seamen, still by far the largest single class of beneficiaries treated. It is interesting to note that while the number of in-patients treated during the year increased by 9.5 percent over that of the previous year, yet the percentage increase in total number of hospital days was only 4.1 percent, a result made possible by additional and improved equipment as well as by the newer methods of treatment, especially in the field of chemotherapy. Reference to accompanying tables will reveal additional interesting statistical information.

CLASSES OF BENEFICIARIES AND AMOUNT AND CHARACTER OF SERVICES RENDERED

Summary of services by class of beneficiary

Class of beneficiary	Hospital days		Out-patient treatments		Physical examinations (not related to treatment)	
	Number	Percent of total	Number	Percent of total	Number	Percent of total
American merchant seamen.....	977, 151	46. 12	500, 365	34. 25	28, 362	12. 08
Coast Guard personnel.....	131, 567	6. 21	216, 240	14. 80	22, 220	9. 46
Coast Guard dependents.....	6, 939	. 33	50, 924	3. 49	116	. 05
Coast and Geodetic Survey personnel.....	2, 704	. 13	3, 868	. 27	334	. 14
Coast and Geodetic Survey dependents.....	302	. 01	2, 073	. 14	8	-----
Seamen, Engineer Corps, and Army Transport Service.....	44, 697	2. 11	20, 983	1. 44	1, 865	. 80
Seamen, not enlisted or commissioned, from other Government vessels.....	702	. 03	296	. 02	73	. 03
Seamen from foreign vessels.....	29, 609	1. 40	3, 461	. 24	18	-----
Persons afflicted with leprosy.....	137, 116	6. 47	145, 172	9. 94	31, 513	13. 41
Employees' Compensation Commission.....	96, 936	4. 58	12, 474	. 85	911	. 39
Immigrants and alien seamen.....	59, 613	2. 81	2, 807	. 19	1, 283	. 55
Army and Selective Service.....	10, 583	. 49	1, 453	. 10	53	. 02
Navy and Marine Corps.....	4, 757	. 23	495	. 03	3, 011	1. 28
Veterans Administration.....	289, 251	13. 65	934	. 06	22	. 01
Civilian Conservation Corps.....	97, 058	4. 58	173, 994	11. 91	48, 017	20. 44
Work Projects Administration.....	195, 853	9. 24	62, 837	4. 30	9, 673	4. 12
Maritime Service.....	5, 224	. 25	91	. 01	197	. 08
Alaska cannery workers leaving United States ¹	-----	-----	-----	-----	13, 348	5. 68
Mariners for licenses.....	-----	-----	-----	-----	63, 868	27. 19
Federal employees for other purposes.....	-----	-----	-----	-----	10, 027	4. 27
All others entitled to treatment.....	28, 733	1. 36	262, 305	17. 96	-----	-----
Total.....	2, 118, 795	100. 00	1, 460, 772	100. 00	234, 924	100. 00

¹ Vaccinations and other preventive measures.

NURSING SECTION

The Nursing Section has continued to expand in size and activities. Incident to the increased demands for medical services the nursing staff has increased from 746 on June 30, 1940, to 904 on June 30, 1941. Sixty-two nurses were on a temporary basis, compared with 55 a year ago, pending replacement by personnel having a Civil Service status. Other personnel in this section, notably guard attendants, showed a corresponding increase.

The installation of the 44-hour duty week has been accomplished for all nurses in the Service other than those on duty in the Federal Reformatory for Women, Alderson, W. Va. In order to accomplish this, it has been necessary to detail a minimum staff to cover certain periods of the day. Additional nurses are required for more satisfactory coverage.

The course in anesthesia for Service nurses established at the Marine Hospital, Staten Island, N. Y., has been continued. A number of nurses have completed this course and are serving satisfactorily as anesthetists in various marine hospitals.

On July 1, 1940, the School of Nursing and the Nursing and Dietetic Services at Freedmen's Hospital, Washington, D. C., were placed under the general direction of the Superintendent of Nurses, United States Public Health Service. Following improvements and adjustments in the services rendered, the School acquired during the year unconditional accreditation.

Superintendent of Nurses Katharine S. Read is in charge of the Nursing Section.

DENTAL SECTION

Dental treatment was given to 120,039 beneficiaries of the Service by 65 full-time dental officers and 32 dental internes. During the fiscal year dental officers were assigned to the following new stations: United States Maritime Training Stations at St. Petersburg, Fla., and Gallops Island (Boston), Mass.; the United States Coast Guard Depot, St. George, Staten Island, N. Y.; the Coast Guard Training Station, Algiers, La.; and the Maritime Training Ship, *American Sailor*.

The major items of treatment furnished and a comparison with the preceding year are shown in the following list:

	Fiscal year 1940	Fiscal year 1941
Number of patients treated.....	110,303	120,039
X-rays.....	33,505	42,683
Prophylactic treatments (hours).....	16,037	19,029
Vincent's stomatitis treatments (cases).....	1,050	1,636
Pyorrhea treatments (cases).....	4,486	4,132
Extractions.....	67,080	63,847
Alveolectomies.....	3,926	4,033
Alloy fillings.....	43,927	47,562
Gold inlays.....	1,242	1,380
Porcelain crowns.....	124	128
Silicate cement fillings.....	17,221	18,840
Dentures (full and partial).....	7,895	7,677
Fracture cases.....	200	306
Number of treatments (out-patient).....	235,357	258,829
Number of treatments (in-patient).....	119,752	122,328
Total number of treatments.....	355,109	381,157

Senior Dental Surgeon N. Y. Hooper was in charge of the clinical dental activities of the Service until April 1941 when he was replaced by Senior Dental Surgeon William T. Wright, Jr.

UNITED STATES COAST GUARD

The average number of Coast Guard beneficiaries on active duty and retired was 17,202 as compared with 13,787 a year ago.

Forty-six medical and dental officers are assigned exclusively to Coast Guard and Maritime Training Service duty and 105 local physicians serve under appointments as acting assistant surgeons to furnish medical and surgical relief and to conduct physical examinations of Coast Guard personnel at isolated units remote from any Public Health Service relief station.

The two motorized dental stations continue to render dental relief to personnel assigned to duty in isolated communities where regular dental facilities are not available, and have been a big factor in maintaining a good morale among personnel of the Coast Guard. Two additional such units could be used to good advantage.

Medical officers have been assigned to cutters on neutrality patrol, weather patrol, cadet practice cruises, and to vessels engaged in special missions. Full-time medical officers continue to serve on the cutters basing at San Juan, P. R., Honolulu, T. H., Juneau, Alaska, and Lisbon, Portugal.

Medical services furnished during the past several years are shown in the following table:

Year	Numerical strength of Coast Guard and medical services given				Average amount of medical service per person		
	Number of Coast Guard personnel	Hospital days	Out-patient treatments	Physical examinations	Hospital days	Out-patient treatments	Physical examinations
1923-----	4,684	41,681	32,530	4,207	8.9	6.7	0.9
1924-----	4,896	36,504	45,857	7,008	7.6	9.4	1.5
1925-----	7,077	60,336	90,494	13,394	8.5	12.8	1.9
1926-----	9,839	71,799	125,226	19,061	7.3	12.7	1.9
1927-----	10,984	76,564	155,977	18,787	6.9	14.2	1.7
1928-----	12,462	85,691	137,971	17,220	6.9	11.0	1.4
1929-----	12,833	88,870	169,697	17,748	6.9	13.2	1.4
1930-----	12,963	90,179	196,334	14,382	6.9	15.1	1.1
1931-----	13,020	86,829	187,063	8,262	6.7	14.4	.6
1932-----	13,189	91,655	198,800	11,481	6.9	15.1	.9
1933-----	13,181	106,126	214,805	9,557	8.0	16.3	.7
1934-----	10,401	88,896	172,510	6,367	8.5	16.6	.6
1935-----	9,413	80,195	151,744	8,966	8.5	16.1	.9
1936-----	10,748	88,325	130,206	5,149	8.2	21.1	.5
1937-----	10,325	91,590	141,939	6,437	8.9	13.7	.6
1938-----	10,014	84,784	121,849	8,234	8.5	12.2	.8
1939-----	11,566	89,456	103,189	5,581	7.7	8.9	.5
1940-----	13,787	121,249	158,389	15,489	8.8	11.5	1.1
1941-----	17,202	131,567	216,240	22,220	7.6	12.6	1.3

Medical Director Carl Michel was assigned to duty at Coast Guard Headquarters as representative of the Surgeon General and Chief Medical Officer of the Coast Guard for the entire year.

NEW CONSTRUCTION

A contract in amount of \$201,732.04 for the construction of a new nurses' home, seven sets of attendants' quarters, and moving and extending the chapel at the Marine Hospital, Fort Stanton, N. Mex., was completed and the buildings were turned over to the custody of the medical officer in charge on June 14, 1941.

New construction and rehabilitation of existing buildings at the Marine Hospital, Carville, La., covered by contract in amount of \$2,374,205 is progressing satisfactorily. The following new buildings covered in this contract were completed and occupied during the year:

- Colony laundry.
- Recreation building.
- Matériel officer's storehouse and office.
- Personnel dining room and kitchen.
- Nurses' quarters.
- Eleven patients' cottages, each containing 30 bedrooms.
- Colony kitchen and dining room.
- Bachelors' quarters.
- Staff laundry.

In addition to the above a new morgue and an animal house extension to the infirmary building were completed and put to use, and certain alterations were made in the Protestant chapel.

The following buildings also included in the Carville contract will probably be ready for occupancy during the early part of 1942:

- Two vocational buildings for patients.
- Administration building (remodeling and repairing).
- Five additional patients' cottages, each containing 30 bedrooms.

During the year many repairs and improvements were made at the various marine hospitals. Contracts for certain major repairs, painting, roadway work, landscaping, etc., at the marine hospitals at Baltimore, Boston, Buffalo, Fort Stanton, Galveston, Kirkwood, Memphis, Louisville, San Francisco, New Orleans, and Norfolk were completed. A nurses' call system was installed at the Marine Hospital, Pittsburgh, Pa., and a doctors' paging system at the Marine Hospital, Seattle, Wash.

At the marine hospitals at Ellis Island, N. Y., Evansville, Ind., Fort Stanton, N. Mex., and Portland, Maine, certain major repairs and improvements were accomplished under W. P. A. projects, the materials having been furnished by the Public Buildings Administration.

In addition to the foregoing, considerable repairs and improvements to the buildings and grounds at nearly all of the marine hospitals were effected by station labor.

SUPPLIES AND EQUIPMENT

The records of the Medical Supply Section for the fiscal year 1941 show that during this period a total of 6,479 requisitions was received. Supplies and equipment to the value of \$1,312,800 (including construction funds) were either approved for purchase through the Procurement Division or bought by this office during the year. The value

of supplies and equipment shipped from the Supply Station, Perry Point, Md., amounted to \$357,138.43. Approximately 3,022 shipments were made from this station. Surplus property received from other Government departments during the year carried an approximate value of \$3,099.16.

FREEDMEN'S HOSPITAL

Freedmen's Hospital was created on March 3, 1865, by an act of Congress entitled "An act to establish a bureau for the relief of freedmen and refugees." Asylums and hospitals were established in various States as well as in the District of Columbia, for the purpose of furnishing food, clothing, shelter, and medical relief for destitute freedmen and refugees. Freedmen's hospitals elsewhere were discontinued within a few years following the act, but the Freedmen's Hospital of the District of Columbia has functioned continuously since its establishment in 1865. Its operation was under the direction of the War Department from 1865 to 1874, under the Department of the Interior from 1874 to 1940, and since June 30, 1940, it has operated under the direction and supervision of the Federal Security Agency through the Surgeon General of the Public Health Service.

The original hospital structure was built in the year 1868-69 on ground now occupied by a part of Howard University. The main building of the present structure, built in 1908, is located on an 11-acre plot of land between Sixth and Fourth Streets and W and College Streets NW., Washington, D. C. Additional buildings have been added from time to time to meet the demands for new facilities, in keeping with increased work and modern trends in medicine. At present there are several buildings comprising the Freedmen's Hospital group, the value of which is \$1,928,874, with equipment valued at \$247,500. It is a general hospital composed of nine units embodying the major divisions of medicine, surgery, obstetrics, and tuberculosis, with indoor and outdoor departments; it has a bed capacity of 552 (including 150 for tuberculosis), and accommodates nearly all classes of diseases. Several of the buildings are devoted to the housing of personnel, chiefly nurses and physicians, and to a number of subsidiary activities.

The new Tuberculosis Annex completed during the year has a capacity of 150 beds and is one of the most modern tuberculosis units in the country. The first tuberculous patients were admitted on January 23, 1941, and it is hoped that this unit will be operating at full capacity within the next 6 months.

Patients eligible for admission to Freedmen's Hospital are, chiefly, indigent residents of the District of Columbia and transients in the District who are destitute, and all emergency cases where delay in treatment would imperil the life or safety of the patient. Under certain conditions pay-patients may be admitted at a per diem rate fixed by the Administrator of the Federal Security Agency.

Freedmen's Hospital has been a teaching center for Howard University Medical School since the early seventies. It has a training school for nurses, is a teaching hospital for medical students, internes,

and graduate internes. It is approved by the American Medical Association, and during the past year the American College of Surgeons, in recognition of the high standard of surgery maintained, placed Freedmen's Hospital on the list of approved institutions for graduate training in general as well as special surgery. These facts are evidence of the very high scholastic and professional standards and are indicative of the important part played by Freedmen's Hospital in the field of medical education today.

Fiscal year 1941	General Hospital	Tuberculosis Annex ¹	Total
Number of patients treated in hospital.....	7,442	95	7,537
Daily average patient load.....	328.6	44.0	372.6
Number of patients discharged (minus deaths).....	6,721	16	6,737
Number of deaths.....	408	18	426
Patients remaining in hospital June 30, 1941.....	313	61	374
Number of days relief in hospital.....	119,958	7,968	127,926
Number of times office relief furnished.....	81,523	5,142	86,665

¹ Opened Jan. 1, 1941; figures are for 181 days, from Jan. 1 to June 30.

RECOMMENDATIONS

It is recommended that proper classification of all Service field personnel be secured to bring about greater uniformity in pay and grade of employees performing similar duties within the Service, and to place them on a comparable plane with employees in other Government agencies who are performing the same type of work.

It is recommended that steps be taken to alleviate the long-standing and troublesome situation occasioned by furnishing in-kind allowances as part of the compensation of hospital personnel. The personal service items have been based principally on the aggregate net cash pay of personnel. The increasing turnover of hospital personnel, particularly in the lower custodial grades, is largely attributable to this factor. It is also increasingly difficult to fill vacancies in positions in which allowances-in-kind are part of the pay.

The following new construction, recommended last year, is again recommended:

Fort Stanton, N. Mex., replacements; Galveston, Tex., extension and remodeling; Carville, La., replacements; Seattle, Wash., additional facilities; Norfolk, Va., and Detroit, Mich., purchase of additional land adjacent to the reservations for expansion; Savannah, Ga., additional land and building facilities; New Orleans, La., additional facilities; New York, N. Y. (67 Hudson Street), repairs, etc.; Pittsburgh, Pa., remodeling and facilities; Mobile, Ala., extension and remodeling; Philadelphia, Pa., remodeling of the relief station. (All of these items are included in House Document No. 177, Seventy-sixth Congress, first session.)

Two tuberculosis hospitals for beneficiaries of the Service are needed, one near the east coast and one in southern California. There is also need for two general marine hospitals, one in the State of Florida and one in southern California. Legislation for the construction of these hospitals is now before the Congress.

CONSOLIDATED AND DETAILED REPORTS

TABLE 1.—*Number of patients treated annually, 1868 to 1941*¹

Fiscal year	Sick and disabled patients furnished relief	Fiscal year	Sick and disabled patients furnished relief	Fiscal year	Sick and disabled patients furnished relief
Prior to reorganization:		After reorganization—Continued.		After reorganization—Continued.	
1868.....	11,535	1893.....	53,317	1918.....	71,614
1869.....	11,356	1894.....	52,803	1919.....	79,863
1870.....	10,560	1895.....	52,643	1920.....	110,907
After reorganization:		1896.....	53,804	1921.....	144,344
1871.....	14,256	1897.....	54,477	1922.....	153,633
1872.....	13,156	1898.....	52,709	1923 ²	126,956
1873.....	13,529	1899.....	55,489	1924.....	159,686
1874.....	14,356	1900.....	56,355	1925.....	204,944
1875.....	15,009	1901.....	58,381	1926.....	245,140
1876.....	16,808	1902.....	56,310	1927.....	249,973
1877.....	15,175	1903.....	58,573	1928.....	240,562
1878.....	18,223	1904.....	58,556	1929.....	260,552
1879.....	20,922	1905.....	57,013	1930.....	279,350
1880.....	24,860	1906.....	54,363	1931.....	259,364
1881.....	32,613	1907.....	55,129	1932.....	257,208
1882.....	36,184	1908.....	54,301	1933.....	294,101
1883.....	40,195	1909.....	53,704	1934.....	304,439
1884.....	44,761	1910.....	51,443	1935.....	329,586
1885.....	41,714	1911.....	52,209	1936.....	327,245
1886.....	43,822	1912.....	51,078	1937.....	350,386
1887.....	45,314	1913.....	50,604	1938.....	560,973
1888.....	48,203	1914.....	53,226	1939.....	398,133
1889.....	49,518	1915.....	55,782	1940.....	415,922
1890.....	50,671	1916.....	58,357	1941.....	537,594
1891.....	52,992	1917.....	64,022		
1892.....	53,610				

¹ These figures do not include patients treated in connection with veterans' relief activities of the Service, as follows: 1918, 192; 1919, 13,856; 1920, 279,036; 1921, 667,832; 1922, 242,379; 1923, 9,704; 1924, 3,414; 1925, 4,360; 1926, 3,749; 1927, 2,830; 1928, 3,448; 1929, 4,907; 1930, 6,817; 1931, 9,278; 1932, 9,667; 1933, 8,377; 1934, 716; 1935, 2,448; 1936, 3,970; 1937, 5,424; 1938, 5,958; 1939, 7,291; 1940, 7,739; and 1941, 9,584.

² In this year, and subsequently, the practice of recounting out-patients applying for treatment in more than 1 calendar month was discontinued.

TABLE 2.—*Transactions at United States marine hospitals and other relief stations*

Hospital or relief station	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospitals June 30, 1941	Number of days relief in hospitals	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
Grand total.....	547,178	77,317	1,658	5,425	2,118,795	469,861	1,460,772	234,924
FIRST-CLASS STATIONS								
<i>Marine hospitals</i>								
Baltimore, Md.....	18,894	6,661	231	400	154,327	12,233	54,687	9,540
Boston, Mass.....	15,910	3,785	54	261	94,455	12,125	34,721	9,966
Buffalo, N. Y.....	4,863	858	21	51	21,469	4,005	12,001	3,421
Carville, La.....	2,704	436	39	373	137,070	2,268	4,977	7
Chicago, Ill.....	11,807	2,631	28	176	67,840	9,176	28,511	11,703
Cleveland, Ohio.....	8,217	2,598	94	202	73,058	5,619	20,073	5,943
Detroit, Mich.....	8,082	3,022	117	238	98,071	5,060	23,667	7,706
Ellis Island, N. Y.....	11,906	3,099	47	367	131,422	8,807	15,536	840
Evansville, Ind.....	1,766	1,262	22	41	23,609	504	1,521	313
Fort Stanton, N. Mex.....	1,930	381	20	157	56,924	1,549	3,749	105
Galveston, Tex.....	8,409	2,746	38	151	60,915	5,663	17,071	3,097
Key West, Fla.....	2,573	896	29	35	13,718	1,677	5,103	135
Kirkwood, Mo.....	5,632	1,606	13	111	43,806	4,026	19,685	6,456
Louisville, Ky.....	3,442	2,015	53	103	38,594	1,427	5,106	2,192
Memphis, Tenn.....	4,464	1,986	7	77	34,647	2,478	8,779	1,868
Mobile, Ala.....	7,611	2,130	37	133	51,666	5,481	20,304	1,467
New Orleans, La.....	16,972	6,062	123	394	152,176	10,910	41,889	4,695
New York, N. Y.....	41,561					41,561	259,461	42,521
Norfolk, Va.....	15,274	4,664	87	241	113,111	10,610	42,841	4,023

TABLE 2.—*Transactions at United States marine hospitals and other relief stations—Continued*

Hospital or relief station	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospitals June 30, 1941	Number of days relief in hospitals	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
FIRST-CLASS STATIONS—CON.								
<i>Marine hospitals—Con.</i>								
Pittsburgh, Pa.	4,574	1,189	8	54	23,788	3,385	8,582	3,166
Portland, Maine	2,573	685	10	45	19,857	1,888	11,140	685
San Francisco, Calif.	18,973	5,671	122	399	158,411	13,302	64,182	6,696
Savannah, Ga.	4,823	1,937	45	157	61,700	2,886	12,700	707
Seattle, Wash.	12,590	4,132	154	276	117,027	8,458	32,994	6,366
Staten Island, N. Y.	18,673	9,438	149	607	224,596	9,235	40,251	3,342
Vineyard Haven, Mass.	275	119	4	13	5,317	156	360	30
Contract overflow hospitals	77	77	2	39	13,934			
Total	254,575	70,986	1,554	5,101	1,991,508	184,489	789,891	136,890
SECOND- AND THIRD-CLASS STATIONS								
Aberdeen, Wash.	536	26	1		128	510	870	66
Albany, N. Y.	115	7			109	108	162	560
Anacortes, Wash.	181	10	1		22	171	395	54
Apalachicola, Fla.	38					38	96	21
Ashland, Wis.	248	20	1		190	228	345	33
Ashtabula, Ohio.	388	28	3	1	325	360	927	54
Astoria, Oreg.	591	44	1		165	547	1,439	125
Balboa Heights, C. Z.	1,708	339	6	10	4,142	1,369	1,511	
Bangor, Maine.	31	1			83	30	36	105
Bath, Maine.	69					69	141	24
Bay City, Mich.	139	6			21	133	214	8
Beaufort, N. C.	756	76	2		500	680	2,383	4
Bellingham, Wash.	224	14	2		.73	210	534	220
Biloxi, Miss.	420	6			55	414	714	38
Brunswick, Ga.	129					129	427	79
Burlington, Iowa	218	72	1		1,028	146	231	159
Cairo, Ill.	669	91		3	701	578	1,693	105
Calais, Maine.	1					1	2	43
Cambridge, Md.	80	9			46	71	145	21
Cape May, N. J.	964	21			124	943	2,559	83
Charleston, S. C.	1,110	116		3	1,280	994	2,761	768
Charlotte Amalie, V. I.	626	45		1	602	581	2,049	29
Cincinnati, Ohio.	146	10	1		167	136	333	1,076
Cordova, Alaska.	270	33	1	1	608	237	409	32
Corpus Christi, Tex.	611	65			377	546	962	225
Crisfield, Md.	509	4			6	565	807	7
Duluth, Minn.	899	104	1	3	741	795	1,132	1.0
Edenton, N. C.	21					21	42	16
Elizabeth City, N. C.	611	7		1	33	604	3,335	49
El Paso, Tex.	408	16		1	194	392	1,646	460
Erie, Pa.	363	13	1		118	350	801	143
Escanaba, Mich.	52	20			103	32	47	23
Eureka, Calif.	247	29			245	218	602	45
Everett, Wash.	140	13			40	127	225	28
Fall River, Mass.	208	13	1		111	195	538	285
Gallipolis, Ohio.	297	14		1	126	283	877	123
Gary, Ind.	105	3			13	102	149	128
Gloucester, Mass.	458	11			58	447	1,108	21
Grand Haven, Mich.	197	13	2		103	184	431	521
Green Bay, Wis.	98	11			63	87	313	77
Gulfport, Miss.	70	3			12	67	140	28
Hancock, Mich.	75	8			69	67	128	59
Hatteras, N. C.	168	2			10	166	364	4
Honolulu, T. H.	3,890	437	13	26	7,585	3,393	8,704	1,113
Houston, Tex.	1,414	50	1		226	1,364	3,812	435
Indiana Harbor, Ind.	265	7			128	258	334	
Jacksonville, Fla.	1,071	124		1	943	947	2,205	1,377
Juneau, Alaska.	451	44	2	1	414	407	660	200
Ketchikan, Alaska.	1,276	119		4	1,167	1,157	2,201	415
La Crosse, Wis.	4	1			2	3	3	71
Lewes, Del.	356	42	1	3	804	314	668	36
Los Angeles, Calif.	4,844	624	1	10	6,437	4,220	13,331	6,008
Ludington, Mich.	225	17		1	157	208	365	1
Machias, Maine.	30					30	74	7
Manila, P. I.	1,363	31	1	2	584	1,329	2,465	1,179
Manistee, Mich.	95	7			59	88	426	30
Manitowoc, Wis.	317	29		1	150	288	547	35

1 Closed Feb. 28, 1941.

TABLE 2.—*Transactions at United States marine hospitals and other relief stations—Continued*

Hospital or relief station	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospitals June 30, 1941	Number of days relief in hospitals	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
SECOND- AND THIRD-CLASS STATIONS—continued								
Marquette, Mich.....	206	25	-----	-----	296	181	842	64
Marshfield, Oreg.....	303	31	-----	3	181	272	583	36
Menominee, Mich.....	87	2	-----	-----	25	85	167	97
Miami, Fla.....	2, 428	158	1	2	966	2, 270	6, 715	1, 749
Milwaukee, Wis.....	1, 357	132	2	1	1, 652	1, 225	2, 479	1, 247
Morehead City, N. C.....	604	81	1	3	766	523	1, 671	31
Muskegon, Mich.....	157	8	-----	-----	142	149	356	38
Nantucket, Mass.....	160	20	-----	-----	132	140	454	7
Nashville, Tenn.....	22	-----	-----	-----	-----	22	64	579
Natchez, Miss.....	551	51	1	1	275	500	1, 283	39
New Bedford, Mass.....	482	70	3	1	550	412	689	246
New Bern, N. C.....	170	25	-----	2	129	145	216	13
New Haven, Conn.....	182	16	-----	1	318	166	256	321
New London, Conn.....	318	24	-----	-----	233	294	393	291
Newport, Oreg.....	242	17	-----	-----	120	225	397	4
Newport, R. I.....	377	58	2	4	1, 224	319	422	128
Newport News, Va.....	211	-----	-----	-----	-----	211	494	27
Ogdensburg, N. Y.....	79	3	-----	-----	5	76	243	27
Olympia, Wash.....	54	10	-----	-----	85	44	61	1
Oswego, N. Y.....	145	20	1	-----	74	125	248	157
Paducah, Ky.....	895	11	1	-----	115	884	2, 381	229
Panama City, Fla.....	672	32	-----	-----	142	640	1, 673	75
Pensacola, Fla.....	1, 012	46	2	-----	482	966	3, 437	161
Perth Amboy, N. J.....	81	8	-----	-----	23	73	93	57
Petersburg, Alaska.....	247	14	-----	1	111	233	679	3
Philadelphia, Pa.....	8, 951	557	8	16	5, 598	8, 394	36, 113	8, 534
Ponce, P. R.....	181	29	-----	1	277	152	224	21
Port Angeles, Wash.....	478	38	-----	-----	112	440	610	43
Port Arthur, Tex.....	3, 254	13	2	-----	61	3, 241	11, 021	1, 905
Port Huron, Mich.....	261	12	-----	-----	85	249	665	428
Portland, Oreg.....	3, 187	293	3	9	3, 557	2, 894	13, 168	2, 633
Port Townsend, Wash.....	188	-----	-----	-----	-----	188	718	6
Providence, R. I.....	466	25	1	2	253	441	930	1, 502
Provincetown, Mass.....	391	-----	-----	-----	-----	391	1, 319	33
Reedville, Va.....	612	-----	-----	-----	-----	612	1, 562	12
Richmond, Va.....	104	9	1	-----	116	95	230	258
Rock Island, Ill. ¹	12, 469	16	-----	-----	278	12, 453	26, 390	3, 021
San Diego, Calif.....	863	84	-----	3	1, 327	779	2, 506	1, 287
Sandusky, Ohio.....	124	13	1	-----	72	111	195	47
San Juan, P. R.....	1, 967	184	4	7	2, 506	1, 783	6, 551	1, 077
San Pedro, Calif.....	5, 531	484	6	17	5, 971	5, 047	13, 361	3, 816
Sault Ste. Marie, Mich.....	773	121	-----	1	724	652	965	106
Seward, Alaska.....	475	58	-----	2	549	417	500	63
Sheboygan, Wis.....	67	3	-----	-----	84	64	115	73
Sitka, Alaska.....	372	11	1	-----	81	361	864	84
South Bend, Wash.....	68	13	-----	-----	91	55	76	5
Southport, N. C.....	1, 346	149	1	1	1, 624	1, 197	1, 472	1
Superior, Wis.....	399	51	1	4	567	348	556	113
Tacoma, Wash.....	294	23	-----	-----	134	271	652	119
Tampa, Fla.....	1, 10	112	3	2	1, 082	993	2, 063	934
Toledo, Ohio.....	699	68	1	-----	759	631	1, 172	307
Unalaska, Alaska.....	98	28	1	-----	257	70	95	10
Vicksburg, Miss.....	417	18	-----	-----	102	399	1, 181	76
Washington, D. C.....	11, 638	398	5	16	5, 611	11, 240	57, 778	28, 780
Washington, N. C.....	113	6	-----	-----	36	107	132	16
White Stone, Va.....	936	-----	-----	-----	-----	936	3, 269	21
Wilmington, N. C.....	595	96	-----	-----	453	499	801	144
Wrangell, Alaska.....	352	30	1	-----	288	322	883	34
FOURTH-CLASS STATIONS								
Bridgeport, Conn.....	45	12	1	3	170	33	44	-----
Chattanooga, Tenn.....	15	-----	-----	-----	-----	15	32	11
Fort Yukon, Alaska.....	1	-----	-----	-----	-----	1	1	-----
Nome, Alaska.....	36	6	-----	-----	30	30	42	-----
Portsmouth, N. H.....	37	3	-----	-----	26	34	38	4
Wilmington, Del.....	44	2	-----	-----	84	42	83	-----

¹ Closed Dec. 15, 1940.

TABLE 2.—*Transactions at United States marine hospitals and other relief stations—Continued*

Hospital or relief station	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospitals June 30, 1941	Number of days relief in hospitals	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
MISCELLANEOUS								
Curtis Bay, Md. (U. S. Coast Guard)	12,460					12,460	42,426	1,994
U. S. Coast Guard Academy, New London, Conn.	6,717	231	1	2	2,178	6,486	22,610	599
St. Elizabeths Hospital, Washington, D. C.	146	146	2	139	49,844			
Special acting assistant surgeons for Coast Guard and Coast and Geodetic Survey	4,911	137	1	2	841	4,774	12,426	1,873
U. S. Coast Guard vessels and bases	16,813					16,813	62,484	3,225
U. S. Maritime Service	24,647					24,647	71,405	8,838
Motorized dental stations	2,004					2,004	7,553	
Veterans' Administration Facility, Livermore, Calif.	7	7	1	4	1,729			
Emergency medical relief activities, Treasury Department	87,784					87,784	116,639	376
Emergency medical relief activities, other agencies	36,155					36,155	50,529	
Emergency	170	25			237	145	258	2,063
Total	292,603	7,231	104	324	127,287	285,372	670,881	98,034
Grand total	547,178	77,317	1,658	5,425	2,118,795	469,861	1,460,772	234,924

TABLE 3.—*Medical services for various classes of beneficiaries*

Beneficiary	Total number of patients treated	Number of patients treated in hospitals	Died	Patients remaining in hospitals June 30, 1941	Number of days relief in hospitals	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
American merchant seamen	161,287	29,038	684	2,445	977,151	132,249	500,365	28,362
Coast Guard personnel	67,652	7,082	38	354	131,567	60,570	216,240	22,220
Coast Guard dependents	13,530	864	7	23	6,939	12,666	50,924	116
Coast and Geodetic Survey personnel	1,232	130	5	9	2,704	1,102	3,868	334
Coast and Geodetic Survey dependents	587	54	1		302	533	2,073	8
Seamen, Engineer Corps, and Army Transport Service	7,659	1,719	32	111	44,697	5,940	20,983	1,865
Seamen, not enlisted or commissioned, from other Government vessels	98	16	1	1	702	82	296	73
Seamen from foreign vessels	2,524	1,279	12	120	29,609	1,245	3,461	18
Public Health Service officers and employees	18,025	1,910	25	59	22,111	16,115	76,198	2,175
Persons afflicted with leprosy	437	437	39	374	137,116			2
Employees' Compensation Commission	39,835	5,372	19	274	96,936	34,463	145,172	31,513
Immigrants and alien seamen	8,638	2,795	12	189	59,613	5,843	12,474	914
Army and Selective Service	1,986	877	6	17	10,583	1,109	2,807	1,283
Navy and Marine Corps	757	373	2	18	4,757	384	1,453	53
Veterans Administration	9,584	9,547	686	792	289,251	37	495	3,011
Civilian Conservation Corps	5,289	4,701	21	167	97,058	588	934	22
Work Projects Administration	49,638	10,449	34	444	195,853	39,189	173,994	48,017
Maritime Service	22,578	240	1	11	5,224	22,338	62,837	9,673
Miscellaneous	135,842	434	17	17	6,622	135,408	186,198	85,265
Total	547,178	77,317	1,658	5,425	2,118,795	469,861	1,460,772	234,924

TABLE 4.—*Classification of out-patient treatments furnished at United States marine hospitals and other relief stations*

	General medical	Dental	Eye, ear, nose and throat	Neuropsychiatric	Tuberculosis	Surgical	Veneral diseases	Tumor clinic ¹	Inoculations and vaccinations	Arsenicals	Physiotherapy and X-ray	Total
Marine hospitals.....	100,633	192,477	50,558	89	611	126,973	72,464	1,594	7,214	23,011	214,267	789,891
Other relief stations.....	89,046	28,006	20,472	189	361	106,157	18,957	.....	19,374	12,067	32,348	326,977
Special acting assistant surgeons.....	7,043	270	587	4	.....	1,589	125	.....	2,622	46	140	12,426
Coast Guard vessels and bases.....	29,696	10,518	6,998	34	29	15,689	2,277	.....	12,385	802	6,666	85,094
Maritime Service.....	24,958	17,219	4,968	12	1	12,207	1,530	.....	8,298	1,116	1,096	71,405
Motorized dental stations .....	.....	7,553	.....	.....	.....	.....	.....	.....	.....	.....	.....	7,553
Emergency medical relief activities, Treasury Department	66,411	.....	17,843	.....	.....	32,385	.....	.....	.....	.....	.....	116,639
Emergency medical relief activities, other agencies.....	32,051	.....	8,063	.....	.....	10,415	.....	.....	.....	.....	.....	50,529
Emergency.....	258	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	258
Total.....	350,096	256,043	109,489	328	1,002	305,415	95,353	1,594	49,893	37,042	254,517	1,460,772

¹ Baltimore, Md.

DIVISION OF VENEREAL DISEASES

Assistant Surgeon General RAYMOND A. VONDERLEHR in charge

THE VENEREAL DISEASE CONTROL ACT

The Venereal Disease Control Act, signed by the President on May 24, 1938, authorized the expenditure of Federal funds for the prevention, treatment, and control of venereal diseases. The act provided for increased appropriations in each of three succeeding years and such sum thereafter as would be adequate to continue the program. The gradual increase in appropriations, paralleling the development and expansion of the venereal disease control program, has made possible the expenditure of these funds in an efficient manner.

In accordance with the requirements of the venereal disease control program, Congress appropriated \$6,200,000 for the continuation of the program during the fiscal year 1941.

The Surgeon General, pursuant to the authority contained in section 4b of the act, determined that \$5,672,388, or 88.8 percent of the total amount available for the fiscal year 1941, should be allotted to the States, the District of Columbia, Alaska, Puerto Rico, the Virgin Islands, and Hawaii to establish and maintain adequate measures for the prevention, treatment, and control of the venereal diseases. For this same period, \$458,600 was set aside from the total appropriation to provide additional funds required for intensifying the program in areas in which the armed forces are located.

The per capita amount spent for venereal disease control by Federal, State, and local sources for the period from the fiscal year 1938 through the fiscal year 1941 has increased more than threefold. During this time the per capita amounts provided by State and local sources have increased from 2.5 cents to 5.1 cents. The Federal funds for venereal disease control in States and Territories increased from 1.8 cents per capita in the fiscal year 1939 to 4.7 cents per capita in the fiscal year 1941.

The total amount of funds budgeted for venereal disease control purposes for the fiscal year 1941 from Federal, State, local, and other sources was approximately \$13,000,000. Approximately \$1 out of every \$4 available for venereal disease control from Federal sources was budgeted for venereal disease control in national defense areas.

DIAGNOSTIC AND TREATMENT FACILITIES

The clinic load of patients with syphilis in the United States has shown a gradual increase. Reasons for this are undoubtedly an increase in the treatment facilities in areas where the attack rates for syphilis are highest and the several Nation-wide drives to find and place under treatment all cases of syphilis. In 1936, approximately 80 percent of persons seeking medical care for some late

crippling manifestation of syphilis had not previously been treated for the disease. Now only 43 percent of these individuals are untreated at the time they come under medical observation.

Laboratory facilities, both public and private, have had their capacity for performing tests for syphilis and gonorrhea strained to the utmost. The number of private laboratories in 34 States increased from 1,254 on December 31, 1939, to 1,270 on November 30, 1940. Sixteen of the States had either or both premarital and prenatal blood test laws in effect for the 11-month period covered. In these 16 States the number of private laboratories increased from 917 to 963, or 5 percent. In Chicago, during a syphilis control program emphasizing free blood tests, the municipal laboratory's volume increased from 116,265 in 1937 to 381,016 in 1939, or 227 percent; the State branch laboratories' from 110,140 to 143,264, or 30 percent; and the private laboratories' from 301,358 to 459,684, or 34 percent. Their gain is more impressive because it occurred in the face of an organized effort to require all laboratories to qualify their techniques for State certification.

Nearly all State laboratories have attained a satisfactory level of efficiency in the performance of serologic tests for syphilis. This is the conclusion of the 1941 survey by the Committee on Evaluation of Serodiagnostic Tests for Syphilis of the Public Health Service, which, during the past 5 years, has surveyed results of the techniques used by the various State laboratories in a program designed to improve and standardize the performance of blood tests for syphilis.

Good serodiagnostic service within the natural limitations of present-day methods is now available in all parts of the country with a few very minor exceptions. The surveying of laboratories in this manner represents one of the most effective and profitable public health movements carried out in this country in recent years. At the present time there are approximately 3,647 laboratories performing tests for venereal diseases. Of this total, 1,376 are administered by State and local health departments. Some idea of the extent of this expansion is apparent from the increased number of serologic tests for syphilis performed in laboratories reporting to State health departments. These tests increased 62 percent during the past fiscal year.

The increase in the number of tests for gonorrhea by State laboratories is significant. The record shows an 18 percent increase in the number of tests performed. The use of cultural methods in determining the presence of the gonococcus is much more frequently used than heretofore. Special studies are being conducted to determine the practicability of extending the usefulness of cultural methods to points at some distance from the laboratory which would require sending the specimen through the mails. Should such a service be developed, it would represent a counterpart of the delayed darkfield examination, thus making available diagnostic procedures in sections remote from laboratories.

A directory of venereal disease clinics in the United States has recently been completed and contains the names and addresses and describes the facilities of 3,100 clinics. Analysis of reports received from more than 80 percent of these clinics shows that all but four exclusively gonorrhea clinics diagnose and treat syphilis and that 72

percent of the total provide the same facilities for gonorrhea. Seventy-seven percent of the total clinics furnish free service to all patients admitted. In one-third of the clinics, evening hours have been arranged in order to make possible the care of those persons who are unable to come at other periods during the day. The number of cases seeking treatment has increased to such an extent that 38 percent of the syphilis clinics and 47 percent of the gonorrhea clinics hold sessions more than 1 day per week. The emphasis that has been placed on prenatal care is illustrated by the fact that 86 percent of the clinics make provision for such cases.

The greatest expansion of clinic facilities is shown in 15 southern States where the number has increased from 789 in 1938 to 1,962 in 1941. The total increase in the United States for this period was from 1,746 to 3,245.

A further indication of the increase in treatments for syphilis is available from domestic sales reports from firms manufacturing and/or distributing arsenical drugs used in the treatment of syphilis for the calendar year 1940. These data, when compared with the record for the preceding 7 years, show that there has been an increase of more than 100 percent in the number of doses of arsenical drugs sold from 1933 to 1940. During the past year approximately 13,400,000 doses of the various arsenicals were sold throughout the United States. This represents an increase of almost 400,000 doses over the calendar year 1939. During the calendar years 1935 and 1936, prior to the beginning of the present intensive venereal disease control campaign, a total of between 6,500,000 and 7,500,000 doses of such drugs were sold annually. Immediately after the beginning of the present offensive against syphilis, the total sales of the drugs used in the treatment of this disease rose to over 10,000,000 doses annually.

Evidence derived from syphilis case reports to State departments of health show that the number of persons with syphilis coming to treatment presumably for the first time since the onset of infection has not increased from year to year in the same proportions as the increase in the sales of antisyphilitic drugs. This would seem to indicate that more intensive antisyphilitic treatment is being rendered to patients seeking care from authorized medical agencies.

The massive dose method of antisyphilitic therapy which has been studied for the past several years looks toward the curing of patients within a relatively short space of time. An analysis of recent progress reports visualizes the possibility of curing at least 85 percent of persons with early syphilis by this 5-day method of treatment. Massive dose, or 5-day, treatment is not at this time recommended for general use or as a method of replacing the standard 70-week system of antisyphilitic therapy. Serious consideration should be given the suggestion of the investigators that its use is justified in the treatment of soldiers and sailors under conditions of war and among such other persons as may include prostitutes and vagrants in whom prolonged treatment may be impossible. Judging from the percentage of patients whose blood remains positive or who show clinical symptoms of syphilis following treatment, the investigators believe that treatment failures after the 5-day course of therapy with 1,200 mg. of mapharsen would probably be between 5 and 15 percent, based on observations up to 1 year. The possibility of eliminating the in-

fection by 5 successive days of treatment offers an opportunity for the rapid control of this disease.

Venereal disease control activity reports submitted by State and Territorial health departments covering the fiscal year 1941 show definite evidence of increased gains in the public health attack on gonorrhea. Research demonstrating the practicability of sulfonamide compounds in the therapy of gonorrhea has resulted in a mass-scale distribution of these drugs by State health departments to public clinics and private physicians for the treatment of indigent and semi-indigent patients. Approximately 7,200,000 tablets of sulfanilamide, sulfapyridine, and sulfathiazole were distributed by the States and Territories. This represents an increase in the distribution of these drugs of 37.3 percent over the previous year.

EPIDEMIOLCGY

The discovery of venereal disease in the population that makes up the reservoir of infection is fundamental to the success of the control program. Accumulated evidence indicates that the health workers charged with case-finding responsibilities are having a greater degree of success than in the earlier periods of the program. Current records show that 44.1 percent of persons reported as seeking treatment from all sources have syphilis of less than 4 years' duration. Even more encouraging is the fact that almost 15 percent are reporting for treatment in the primary and secondary stages of the disease.

The records show a marked rise in case-finding efforts and in the number of tests performed for the detection of gonorrhea. Laboratories reporting to State health departments performed the following examinations for the detection of the gonococcus in 1941: 1,116,971 examinations of smears; 33,723 complement fixation tests; 73,533 examinations by means of culture. This represents an increase of 17.9 percent over the previous year.

Epidemiological services in clinics treating syphilis improved approximately 50 percent from the close of the first half of the fiscal year 1940 to the close of the first half of the fiscal year 1941. For every 100 contacts reported in 1940, 34 were examined for evidence of syphilis, as contrasted with 59 in 1941. However, in 1941, there remained 2 out of every 5 individuals named as contacts who were not examined for syphilis. In 1941, of those who were brought to examination and found infected, 95 percent were placed under treatment or were found to be already under treatment.

There was a great difference in the proportionate number of persons named as exposed contacts per 100 persons admitted to clinics with early syphilis in the fiscal years 1940 and 1941. In 1940, an average of 139 persons were alleged to be contacts of each 100 cases admitted to treatment for early syphilis, in contrast with an average of 191 persons per 100 new patients admitted to treatment for early syphilis in 1941.

A contribution to the knowledge of case-finding in a given population group is illustrated by a composite report from 17 of the 25 States having legislation requiring blood testing of couples applying for marriage licenses. Among 853,220 predominantly young and vigorous Americans tested for syphilis, 15 out of every 1,000 were found to have a positive reaction. Thus, 12,954 infected individuals were

made aware of their infection in time to realize the greatest promise of "cure," provided by early treatment. While only two of the southern States were represented, the rates for syphilis in these States, as would be expected from previous studies, were among the highest. No great differences existed in the range of syphilis rates in the eastern, central, and Pacific coast regions. Great differences do exist, however, in the prevalence of syphilis in individual States within each region.

The fact that 12,954 persons were found infected demonstrates that premarital blood testing is a case-finding measure. Such legislation may, in addition, as many contend, have a greater value in its educational effect upon the population.

The first law requiring a premarital examination and blood test for syphilis of both partners was passed in Connecticut in 1935. Two years later, 5 States passed such legislation, and in the following year 3 more States were added. Subsequently, in the following 3 years, 16 more States passed this type of legislation, making a total of 25 States within a period of 6 years. An additional case-finding measure was developed by means of legislation requiring prenatal blood tests. Since 1938, 18 States have adopted this type of legislation.

In addition to the case-finding results of premarital and prenatal legislation, added impetus was given to the necessity of having serodiagnostic tests for syphilis performed in approved laboratories. By this means, the pioneer work conducted by the Committee on Evaluation of Serodiagnostic Tests for Syphilis has found a practical application in increasing the efficiency of the tests performed in laboratories throughout the country and particularly in those States having this type of legislation.

The means by which case-finding can be accomplished are ever developing on a wider front. Various plans have been put into operation, such as an intensive search for infected persons as was conducted in Chicago during 1937; the mobile clinic which reaches outlying districts; the increasing use of the routine serologic test on patients admitted to hospitals and out-patient departments; the expansion of the program for the control of venereal diseases in industry, which is reaching a large part of the population, heretofore not specifically brought under the control program; the plan of the Selective Service System which includes a blood test on all candidates who are examined for entrance into the military service; and finally, many miscellaneous groups, such as women's clubs, civic organizations, etc., whose members voluntarily submit to having a test made and in many instances request or require their servants to be examined.

Case-holding.—While the problem of case-finding and case-holding is one of paramount importance in the control of venereal disease, the exigencies of the national defense program required that expenditures be directed largely to service functions which would be of direct usefulness in defense. Expenditures for laboratory and treatment services were therefore increased by two-thirds and one-half, respectively. This meant that only a relatively small increase of 15 percent in the allocations for case-finding and case-holding was available in the fiscal year 1941. However, case-holding in clinics has improved. This is clearly indicated by the fact that while clinic admissions for syphilis increased 18 percent in 1941 over the preceding year, the

average patient load increased 32 percent. While some of the increase in the patient load must be ascribed to admissions in previous years, it is estimated that in 1941 the length of the treatment period, for the average patient, has been increased by about 1½ months.

There are many factors which affect the successful manner in which this is accomplished. Many State health departments have included as a part of their morbidity reporting system provisions by which the private physician may request the aid of the State and/or local health department in maintaining his cases under treatment. In the clinic, as well as in the private physician's office, the degree to which the patient is educated on the facts about his disease will have a very definite influence on the subsequent course of events. The long period required for the treatment of syphilis, together with crowded waiting rooms in clinics, and inadequately equipped treatment facilities, has contributed in the past to the primary reason for patients' discontinuing treatment prematurely. Some improvement of these considerations has been made possible through the continuation of Federal and State legislative interests supported by reasonably adequate appropriations. However, the increased load which has resulted from the present emergency has seriously handicapped the program at this stage since an intensification in military and industrial defense areas has become a necessity and has required considerable sums of money which have been made available from venereal disease control budgets designed for the general program.

GONORRHEA

The advent of sulfonamide compounds and the more general use of cultural methods for the determination, diagnosis, and cure of gonorrhea have provided the means by which gonorrhea has assumed a more active role in the venereal disease control program. Since gonorrhea may be acquired repeatedly, it is often a recurring cause of disability and therefore results in a significant economic loss to workers in industry, and in the armed forces increases the noneffective rate. According to the 1940 Annual Report of the Surgeon General of the Army, gonorrhea is shown to be the leading cause of lost time when based upon the mean annual strength of the forces.

During the past year the Public Health Service has continued the cooperative undertaking with the American Neisserian Medical Society in the study of evaluating the effectiveness of the many sulfonamide compounds. Plans have been completed for a rapid appraisal of the relative efficiency and toxicity of these drugs in the treatment of gonorrhea.

The most recent report of the study indicates that sulfathiazole and sulfapyridine are equally effective in curing gonorrhea in the male but that sulfathiazole is superior in the rapidity with which it eliminates clinical symptoms and is also less toxic. The study demonstrated that these two preparations probably produce cures based on the disappearance of symptoms and on bacteriologic tests with almost equal speed throughout the 5-week treatment-observation period. After 5 weeks, either drug had eliminated the clinical symptoms in 94 percent of the cases. Reactions of such severity that sulfonamide treatment had to be discontinued occurred in only 1.3 percent of the cases treated with sulfathiazole and 3.8 percent of those

treated with sulfapyridine. The number of cases which became asymptomatic gonococcus carriers was small—none for cases treated with sulfapyridine and 5.5 percent for those given sulfathiazole. Sulfathiazole was distinctly superior to sulfapyridine in curing cases which had resisted previous sulfonamide treatment. A larger dose, consisting of 20 grams in the first week, appeared to be superior to small dosages in producing good results either with sulfathiazole or with sulfapyridine.

Morbidity reports from State and Territorial health departments, as well as activity reports from clinics treating gonorrhea, indicate that an increasing number of persons have been seeking authorized medical care for this disease. While case reports to health departments from private practitioners and clinics have increased by 10 percent since 1940, the number of persons admitted to treatment in gonorrhea clinics has increased by 26 percent for the same period.

The rapid growth in the use of sulfonamide drugs in the treatment of gonorrhea has apparently resulted in a sharp decrease in the average duration of treatment per infection. A reflection of this trend is observed in the fact that the average monthly patient load in clinics has decreased by 13 percent, although the number of persons admitted for treatment over the same period has increased by a considerable percentage. While there has also been a decline in the actual number of treatment visits in gonorrhea clinics, the more significant fact is that the ratio of treatment visits to patients admitted for treatment has decreased by approximately 30 percent since 1939.

Thus, the use of sulfonamide drugs, by decreasing the duration of treatment, has permitted the expenditure of additional funds for the uncovering of gonococcal infections in the general population. The extent to which funds have been employed for this purpose is demonstrated by the increase in the number of laboratory tests for gonorrhea actually performed from 1939 through 1941. During the fiscal year 1939, 605,631 tests for the detection of the gonococcus were performed in laboratories reporting through State and Territorial health departments. For 1940, 1,038,086 such tests were performed, an increase of 71.4 percent. During 1941, 1,224,227 such tests were performed, an increase of 17.9 percent. A comparison of the period 1939 to 1941 shows a total increase of 202 percent in the number of tests performed.

The majority of State health departments now furnish sulfonamide compounds to clinics, and, in many instances, to private physicians for the treatment of gonorrhea. Rapid progress in the control of this disease is a real possibility as judged by the effectiveness of the relatively new addition of sulfonamide drugs to our armamentarium.

COOPERATION WITH NATIONAL DEFENSE PROGRAM

The mobilization of military forces, together with the marked increase in industrial defense activities, introduced numerous problems which have required an intensification of the venereal disease control program.

Early in the present emergency, the Army, Navy, Public Health Service, and private agencies interested in health and welfare, formulated an effective cooperative program. The resulting agreement was

adopted subsequently by the Conference of State and Territorial Health Officers.³ From the viewpoint of Federal, State, and local activities directed to the prevention of venereal diseases among the armed and industrial forces, the agreement provides:

1. Early diagnosis and treatment of the civilian population by the local health departments, with full utilization of the facilities available in the State and local health services, to bring under treatment as promptly as possible all men found to be infected with syphilis.

2. Reports to the State or local health authorities, by the medical officers of the Army and Navy, of all known and probable sources of venereal infection in the military or naval personnel.

3. Reports by the State or local health officers, to the medical officers of the Army and Navy, of all contacts of enlisted men with infected civilians.

4. Forceful isolation, by local health authorities, with the assistance of the local police, of recalcitrant infected persons with communicable syphilis or gonorrhea during the period of communicability.

5. Decrease, as far as possible, opportunity for contact with infected persons—the State and local health departments, the Public Health Service, and the Army and Navy cooperating with the local police authorities in repressing prostitution.

6. An aggressive program of education among both enlisted and civilian populations regarding the dangers of venereal disease, the method of preventing infection, and the steps to be taken by a person who suspects that he is infected.

This statement of policy was unanimously adopted by the conference of State and Territorial Health Officers in May 1940.

Before mobilization took place under the Selective Service System, the Public Health Service conferred with this organization for the purpose of developing a cooperative program which would provide for the discovery of venereal disease among those who were being inducted into the armed forces. The resulting agreement made possible the examination of a large representative portion of the manpower of this country and thus a more exact determination of the prevalence of the venereal diseases. This also provided an opportunity to bring under treatment a larger number of men infected with syphilis and gonorrhea than had ever before been treated in the United States.

Blood tests for syphilis are included as a routine part of physical examinations which are given by local draft boards. The Surgeon General addressed a letter to all State health officers pointing out that medical regulations of the Selective Service Board include this provision and urging full cooperation by State and local health authorities.

Blood specimens are taken by the examining physician of the local board and forwarded to the State laboratory or other laboratory designated by State Selective Service headquarters. The State health departments are requested to perform the test and to furnish the necessary containers and report forms for the blood specimens.

In the first million selectees tested and examined, some 50,000 were found to have venereal disease. The rate for syphilis among these men, aged 21–35, was 45.2 per 1,000; the gonorrhea rate, 11.5 per 1,000. Based on this information, the prevalence of syphilis is estimated at 3,200,000 cases in the United States. The estimated 3½ million persons with syphilis are distributed 50–50 between white and nonwhite races and two for one between urban and rural residents. One in every 42 persons in the United States has syphilis now. Sixty percent of the cases are in the 16 Southern States and the District of Columbia.

³ See Appendix B, page 205.

Inasmuch as selectees found to have a venereal infection are deferred, plans are being formulated for the treatment of such persons in order that they may subsequently report again for examination, and, if found free of the disease, be certified for military service.

As a result of this expansion in the number of persons upon whom blood tests for syphilis are being made, State health officers are faced with the challenge of providing increased treatment and epidemiological services to insure the adequate treatment of all infected individuals and the thorough investigation of all contacts of such infected persons.

An inquiry was made to determine how many of the candidates for induction into the Army under the Selective Service System who were found to have a venereal disease had been investigated, how many brought under treatment, and how many were already under treatment. In 22 States, the District of Columbia, and Hawaii, where this information was available for tabulation, only 31 percent of the total cases were brought under treatment or were shown to be already under treatment. Moreover, only 43 percent of the total cases had been investigated, owing to lack of facilities for this epidemiological work. This situation existed in a group of States where the prevalence rate was little more than half that for the United States.

Limitation of clinic facilities to provide treatment for infected selectees has been reported by some States. For example, reports from the Alabama State Health Department indicate that the treatment of infected registrants and selectees has increased the clinic load in some areas fifteenfold. The average syphilis patient load in the State increased from 7,423 in the fiscal year 1940 to 13,513 in the first half of the fiscal year 1941 and to 22,000 in June 1941.

Progress in the control of syphilis will be greatly accelerated within the next few years if adequate funds are made available to provide epidemiological, diagnostic, and treatment facilities for the care of those persons found to have an infection through routine physical examinations, including blood testing, under the Selective Service and premarital and prenatal legislation. Present facilities are insufficient to follow up and place under treatment more than 25 percent of the persons showing evidence of syphilis or gonorrhea through these mass testing programs.

Liaison officers have been detailed by the Surgeon General to certain headquarters offices of the Army to help develop the health program in national defense areas. A considerable portion of the liaison officers' activities is devoted to venereal disease control problems. In addition, 4 United States Public Health Service officers are devoting full time and 12 officers at least half time in the field to aid in the solution of problems arising out of concentration of military forces and workers in defense industries.

Prostitution has created a problem in the control of the venereal diseases in practically all defense areas. The Public Health Service, in cooperation with the American Social Hygiene Association, has conducted studies to determine actual prostitution conditions in such areas. Information obtained through these studies has helped in planning the needs for more adequate venereal disease control measures. In order to aid in the solution of this problem, the Congress recently enacted legislation to prohibit prostitution within a "reasonable" distance of military and/or naval establishments. The act

provides that the Secretaries of War and/or Navy shall determine the area within which this act shall be made applicable.

In cooperation with the Work Projects Administration, plans were developed for the operation of a Nation-wide program of research and demonstration in venereal disease control methods and record systems. The purpose of this certified national defense project is to provide a program of assistance to regular venereal disease control activities in defense areas. Special emphasis will be placed on the follow-up and treatment of the exposed contacts of military and industrial personnel. Insofar as available, in accordance with the procedures of the Work Projects Administration, this assistance will include research, clerical, clinical, and laboratory workers, and in addition, field workers to search out and direct all infected persons to treatment. Where subprojects of this national defense research and records assistance project are placed in operation to supplement existing venereal disease control efforts, State or local health agencies will act as sponsors under the general direction of the Federal cosponsor, the United States Public Health Service.

Our armed forces have long been aware of the relationship between civilian and military health. It is fully as important from the standpoint of national defense to control venereal diseases in the general population as in the military. Infections among military personnel, as well as in industrial defense areas, originate in adjacent communities. Past experience has demonstrated that the venereal disease attack rate in a given military command or area of industrial defense concentration reflects the efficiency of the control measures operating in adjacent communities.

COOPERATIVE WORK WITH STATE HEALTH DEPARTMENTS

A period of more than 5 years has elapsed since the Advisory Committee to the United States Public Health Service described plans for venereal disease control work in the health departments throughout the United States. During this interval considerable experience has been gained as a result of the actual development and progress of the control program, and, therefore, it was thought desirable to consider again the basic recommendations in order that the report may be brought up to date.

The report of the Committee has been divided into two parts. The first includes broad recommendations pertaining to the control of venereal diseases, and the second describes those detailed measures which the Committee considers to be most desirable and effective parts of a good program.

The large-scale Army maneuvers in the spring of 1940 presented the first major challenge to public health in the adaptation of venereal disease control measures to modern national defense in the United States. This was met, in the main, by concentration of trained personnel in the maneuver areas and by strict adherence to public health principles in diagnosis, treatment, and epidemiology.

Every effort has been made to strengthen State and local health departments in military and industrial defense areas. The Public Health Service has made available the entire resources of its personnel and facilities to protect the health of the military forces through the establishment of control measures, and to safeguard and maintain at

a peak of efficiency the industrial agencies on whom such a tremendous responsibility rests today.

The Surgeon General called an emergency meeting of the State and Territorial health officers in September 1940. The purpose of this meeting was to consider ways and means of providing a blood test as a part of the regular physical examination for all candidates who would be called into military service. This involved some 17,000,000 men between the ages of 21 and 36 years, and provided unprecedented opportunity for the detection of syphilis and the application of public health measures designed for the control of venereal disease.

The Selective Service System found it advisable to include blood tests for syphilis and clinical examinations for gonorrhea and syphilis as a part of all routine physical examinations. The Public Health Service and State departments of health have cooperated by providing laboratory and other services.

Under the Selective Service and Training Act of 1940 candidates found to be infected with syphilis or gonorrhea are deferred. With the recent advances in gonorrhea therapy through the use of sulfonamides, it now appears unnecessary to eliminate men with uncomplicated gonorrhea. The State and Territorial health officers and the Administrator of the Federal Security Agency have recommended that persons called for service and found to be infected with uncomplicated gonorrhea or urethritis should be inducted into service and promptly treated.

The policy of allowing certain portions of the funds allotted to the States for venereal disease control to be budgeted for training of personnel has been continued. The Public Health Service has continued to cooperate with various State and local health departments in conducting research projects for the study and demonstration of special aspects of the venereal diseases and their public health control.

COOPERATIVE RESEARCH STUDIES WITH OTHER AGENCIES

The policy of the Division of Venereal Diseases to cooperate with other agencies in research studies has been curtailed, and all funds devoted to this end have been reallocated to investigations and demonstrations in national defense areas.

Studies on the effectiveness of various sulfonamide compounds have been continued and considerable progress has been made. A preliminary report showed that 80 percent or more of the patients treated with sulfapyridine, sulfathiazole, or sulfanilamide became negative to culture tests for gonococci and remained so during 2 to 3 months of follow-up observation. Sulfapyridine seemed to result in the lowest percentage of patients who had bacteriological recurrences during the time observed, but the difference was not statistically significant. Sulfathiazole, on the other hand, was apparently least toxic and perhaps most effective in relieving marked discharges.

Rapid appraisal of the effects of the sulfonamides introduced in gonorrhea therapy began operation in January 1941. By this method the current case reports of the group of the participating clinics are pooled and subsequently analyzed. The plan was designed to overcome the lag between individual clinic evaluation of these drugs and the application of this new knowledge following publication in scientific journals. A simplified report in graphic form is made each month in the journal, "Venereal Disease Information."

A study to obtain additional information on the serologic response of patients treated by massive dose intravenous therapy in clinics in the Middle West is being continued. The routine qualitative serologic test has been supplemented by the quantitative test.

The data obtained during the fiscal year indicate certain serologic trends which in time may prove of significance clinically. Of 334 cases studied qualitatively in from 3 to 12 months about 60 percent show a gradual reduction in the serologic titer from some high level to negative. The remaining cases included those which show some reduction in the serologic titers but which are still either seropositive or doubtful (25 percent), and cases which show either little or no reduction in the titers and serologic flareups (15 percent). The behavior of serologic titers may prove to be an indicator in many cases of clinical response to this type of therapy.

Certain studies of lymphogranuloma venereum have been continued. A series of cases treated with sulfanilyl-guanidine indicate a therapeutic value about equal to that of sulfathiazole. The results obtained by the use of complement fixation tests have continued to follow a high degree of correlation with those obtained with the Frei test. The opinion of the investigator suggests that the complement fixation test is of a higher order of specificity than the Frei test and that it will ultimately be regarded as the final court of appeal as to whether or not a clinical condition is lymphogranulomatous.

The study of purification of antigens has been continued. The investigators have constantly been in search of new and improved assay methods. They have used four general types of assay and have been able to show good correlation among three of them.

Animal experiments (on dogs) during the past year were conducted to determine the maximum tolerated and the minimum lethal doses of mapharsen when given by the continuous drip method. The maximum tolerated dose introduced was found to be 10 mg. per kg. of body weight per day for a 5-day treatment period. The minimum lethal dose was determined to be 12 mg. per kg. of body weight per day for the same treatment period. Thus it is shown that the amount of mapharsen which may be given without toxic effects is much greater when the drug is given by the continuous drip method than it is when given by single injection. However, the maximum tolerated dose is not increased to the same degree that the therapeutic dose has been increased in patients receiving mapharsen in the treatment of syphilis, which would indicate that the margin of safety is considerably less and that caution must be used in the adoption of the continuous drip method as a therapeutic measure.

Other cooperative projects include: (1) Studies of methods of public education and training of personnel; (2) intravenous vaccino-therapy in lymphogranuloma venereum; (3) transmissibility of syphilis by seminal fluid and vaginal secretions; (4) a further investigation of congenital syphilis; (5) the thermal death time of *Treponema pallidum* and the treatment of congenital syphilis by combined fever and arsenicals; (6) epidemiological and biological study of gonococcal infection; (7) test of the curative effects of a single fever treatment maintained at 41.5° C. upon late and latent central nervous system syphilis; (8) chemistry of the gonococcus; (9) study of fever therapy and early latent syphilis; (10) search for new arsenicals of greater

therapeutic efficiency; (11) serologic and immunologic relationships between cultured and pathogenic strains of *Spirochaeta pallida*.

COOPERATIVE CLINICAL GROUP STUDIES

Studies designed to evaluate the results of treatment of syphilis have been continued by the Cooperative Clinical Group during the year. These studies include:

Symptomatic neurosyphilis.—A report has been prepared for publication which deals with the clinical and serologic results after various plans of treatment for the six major types of symptomatic neurosyphilis.

Early syphilis.—This study, which is a reevaluation of the early syphilis material, will include patients treated since 1930 and followed for a minimum of 2 years in addition to patients with long periods of observation who were included in the original study. Abstracting of case records for this study has been completed.

Cardiovascular syphilis.—Collection of material to establish criteria for the diagnosis of uncomplicated aortitis has been completed. The data are in the process of analysis.

Correlation of autopsy and clinical evidence of syphilis.—In order to determine the frequency of syphilis as a primary or contributory cause of death, approximately 14,000 clinic records have been abstracted and are ready for statistical analysis.

Follow-up of apparently normal children born to syphilitic parents.—The primary aim of this study is to determine whether the original diagnosis of normality in a child born to a syphilitic mother can be maintained over a period of several years of subsequent follow-up. Preliminary tabulations have been completed.

Interstitial keratitis.—The report, "Analysis of 532 cases of interstitial keratitis with particular reference to standardization of treatment," has been accepted for publication at an early date.

Syphilis in pregnancy.—Abstracts of records of women with acquired syphilis previously treated but untreated in a given pregnancy have been assembled to determine when treatment of a pregnant woman is necessary to protect the child. These data are ready for statistical analysis.

Benign late syphilis.—Basic analyses of the records of 850 patients with benign late syphilis have been completed and will shortly be summarized for publication. The presentation will show the distribution of cases by age, sex, and color as well as by type of lesion and method of treatment. The effect of treatment upon the serology and upon progression of lesions will also be indicated.

Nonspecific therapy in the treatment of neurosyphilis.—The report, "Malaria and artificial fever in the treatment of paresis," was published during the year.

VENEREAL DISEASE RESEARCH LABORATORY, STATEN ISLAND, N. Y.

During the current fiscal year the Venereal Disease Research Laboratory has continued to follow a balanced program designed to encompass all of the venereal diseases with emphasis upon the two members of the group (gonorrhea and syphilis) which are of major public health importance. An appreciable expansion of the activities over any previous period has necessitated considerable increases in

personnel and physical facilities. The maturity of present plans envisage the creation of a unit capable of engaging in a still broader field of investigative activity and a more active participation in the public health aspects of the venereal group, especially in control serology.

In the field of experimental syphilis, efforts toward the development of an effective prophylactic agent have been continued. Key compounds and substances have been tested as to their ability to prevent the penetration of the mucous membrane of the rabbit by the syphilis organism. Translation of the resulting advances in knowledge into methods of practical usefulness is not warranted at this time.

Certain aspects of the biology of the syphilis spirochete, specifically the life cycle and the possible presence of unrecognized transition stages, have been made the subject of a study being pursued jointly by the Laboratory and the Research Laboratory of the Bell Telephone Co. Interesting progress has been made in detailed studies of the organism by means of ultraviolet microscopy and through cinematographic time studies of living individual spirochetes of virulent and culture strains.

In syphilis serology several experimental studies dealing with practical aspects of tests have been pursued. Two papers were completed and published. In addition to a research program, the serology section has carried on a routine of testing, having performed 108,879 tests on 35,024 specimens of blood and spinal fluid. Control performances were contributed to 28 States and the Dominion of Canada engaged in serologic evaluation work, and training in the various tests was extended to a total of 21 students. The Laboratory also supervised the technical phases of the annual Interstate Serodiagnostic Evaluation Study.

In the field of chemistry, studies have been continued dealing with the chemical identity of the active principle of antigens used in tests for syphilis. The results up to this time clearly show that the active substance may be found in several basic fractions and leads to the inference that its isolation will probably require a comprehensive research in chemical methods.

In bacteriology a program of research in culture methods incorporating the new growth-stimulating factors has been followed. In addition, the conduct of a heavy routine of gonococcus culture work engendered by the clinical evaluation of sulfonamide drugs resulted in 9,518 cultures and 6,994 spreads from 5,508 patients. Eight students have received training in laboratory culturing and identification of the gonococcus. Also a detailed study of the culture characteristics of the so-called culture strains of the *Spirochaeta pallida* has made progress during the year. Repeated efforts to culture, artificially, virulent organisms from animal lesions have failed.

The work dealing with the chemotherapy of gonococcal infections made very satisfactory progress during the year. The study of patients treated with sulfathiazole was effective in determining that satisfactory cure rates were obtainable with a conservative routine of treatment which reduced to a minimum the danger from severe toxicity. The therapy thus seems to suggest itself strongly as a means of revitalizing the movement toward the control of gonorrhea.

VENEREAL DISEASE CONTROL IN INDUSTRY

Recognizing the influence of the Civil Service Commission on the employment policies of industries throughout the country, the Public Health Service has continued to cooperate in the study of the medical records of civil service applicants who have syphilis to determine their physical eligibility for employment. Some progress has been made in modifying the policies of the Commission to correspond with modern medical knowledge of syphilis. Applicants who are noninfectious but who cannot yet be recommended as good industrial and retirement compensation risks can now be given temporary civil service appointments pending the completion of antisypilitic treatment and observation. Utilization of this new provision has resulted in the more rapid mobilization of many of these applicants for national defense work.

During the fiscal year, 538 opinions were given to the Civil Service Commission with respect to the eligibility for employment of applicants with syphilis. Of these, 243 were recommended for permanent employment. Seventy-six applicants were not recommended for employment because of poor industrial and retirement compensation risk caused by syphilitic involvement of the heart, nervous system, and other organs. Another 219 applicants were recommended as noninfectious and therefore eligible for temporary employment not involving retirement benefits. Twenty-five of these 219 noninfectious applicants were considered not eligible for permanent employment; 98 are still being studied as of June 30, 1941, to determine their eligibility for permanent employment; and the remainder of these 219 files have been closed, either for failure of the applicant to submit essential medical evidence or pending further treatment and observation. In 335 instances no opinion was given because of failure of the applicant to submit essential medical evidence.

A number of State and local health departments and Federal agencies have assisted in this work by furnishing medical records and by performing examinations on applicants who were unable to pay for the services of private physicians.

The intensification of activities concerned with the venereal disease control program in industry has received added stimulus as a result of the national defense program. The Division of Industrial Hygiene of the National Institute of Health and the Division of Venereal Diseases have collaborated in the development of such a program. A conference in April 1941 of representatives from both Divisions resulted in the promulgation of definite recommendations in this field.

A commissioned officer has devoted his full-time attention to this problem throughout the year. An advisory and consultory service was provided State and local health departments and industrial organizations. A study was made of all venereal disease control programs in 12 States relative to the provisions made for the needs of a program for the control of venereal diseases in industry. The following provisions in the general venereal disease control program were considered basic essentials: (1) An active educational program; (2) free diagnostic laboratory tests, including the serologic test for syphilis, and smears (culture service desirable) for the identification of the gonococcus; (3) free distribution of drugs for the treatment of syphilis and gonorrhea; (4) a follow-up which would cooperate with industrial medical services in placing infected persons under treatment, make

contact investigations, and aid in returning lapsed cases to treatment; (5) a plan for providing free diagnosis and treatment for medically indigent patients either through organized clinics or in some areas by private physicians.

The most effective approach to the control of venereal diseases among industrial workers has been the subject of several conferences between representatives of the Division of Venereal Diseases and the Division of Industrial Hygiene of the National Institute of Health. On June 25, 1940, general recommendations were made for the conduct of such a program. These recommendations were carefully reviewed and their application studied in State and local health departments and in industries. Formal recommendations were made for the development of a program for the control of venereal diseases in industry and adopted at a conference in Washington, D. C., April 30, 1941.

The following represents material prepared for the prosecution of such a program:

1. An organization chart.
2. Introductory phase of development of a program for the control of venereal diseases in industry.
3. A program for the control of venereal diseases in industry.
4. A program for the control of syphilis in industry as developed by a representative industrial organization.
5. Suggested questionnaire for surveys of industrial plants.

Representatives from the Division of Venereal Diseases and the Division of Industrial Hygiene met in Detroit, Mich., on June 20, 1941, with the Committee on Industrial Health and Medicine of the Health and Medical Committee of the Federal Security Agency. The purpose of this meeting was to review the program proposed by the Service for the control of venereal diseases among industrial workers. The following motion was passed: "The Committee on Industrial Health and Medicine of the Health and Medical Committee of the Federal Security Agency, realizing the importance of venereal disease control in industry, indorses the appointment of a committee to help promote the control of venereal diseases in industry, and recommends that it consists of medical personnel."

Twenty recent serological surveys of syphilis in industry have been reviewed. The summary involved approximately 425,000 workers in 800 miscellaneous industrial establishments in about 25 communities. The positive rates for syphilis range from a low of one-half to a high of 10.5 percent, with an average of approximately 3.0 percent. In 1937 a positive rate approaching 5.0 percent was reported for 150,000 workers tested in 150 miscellaneous industrial establishments.

This indication that the positive rates for syphilis in industry in general have declined since 1937 is borne out by surveys in a number of industries with well established programs for the control of syphilis.

The positive rate among industrial workers in Chicago decreased from 3 percent in 1939 to 2.4 percent in 1940. Slightly more than 66,000 were tested in 1939 and 78,800 in the following year. The positive rate for coal miners employed by the New River Coal Co. in two counties of West Virginia declined from 9.1 percent in 1931 to 6.7 percent in 1938. About 3,250 employees were tested in each period.

The positive rate among employees of the du Pont de Nemours Co. in 18 plants in 10 States remained virtually unchanged from 1934-35 to 1937-38, but decreased sharply from 4 percent in 1937-38 to 1 per-

cent in 1940-41. From 27,000 to 51,000 employees were tested in each of the 3 periods. Decreases occurred in all but one of the 18 plants.

A syphilis control program was inaugurated in Cincinnati in 1939. Serological reports on 37,864 industrial workers tested for syphilis show a positive rate of 4.2 percent. This figure gives some measure of the syphilis problem facing defense industries in Cincinnati. The rate appears high compared to those found in some other industrial surveys, e. g., 2.4 percent among 78,800 Chicago workers, and 1.7 percent among 15,300 in New Jersey. The program thus far in Cincinnati has revealed that 1,576 industrial workers have syphilis.

EDUCATIONAL AND INFORMATIONAL ACTIVITIES

The crucial importance of the time element to the Nation's defense effort has been the motivating force behind venereal disease educational and informational activities during 1940-41. As diagnostic and treatment activity has been intensified to meet current needs, increased emphasis concurrently has been placed upon the preventive measures—upon reducing the tendency to, and the opportunity for, exposure; upon reducing the number of infections resulting from exposures not prevented—measures which may be expected to produce immediate results.

Prevention of venereal disease is essentially an educational matter. Thus, emphasis has been placed on the utilization of educational and public relations techniques and materials as practical instruments of venereal disease control. This has been not only with particular and immediate reference to areas of military and industrial defense concentrations but also with a view to laying a groundwork for a future long-term program. Experience during and after the World War clearly indicates that the future course of venereal disease control work may depend on the degree to which a sound educational and public relations program is carried on during these crucial days.

State and local cooperation.—The defense crisis has aggravated a number of fundamental problems which have been present in greater or less degree since the beginning of the current Federal-State control program. Among these have been (1) an acute shortage of personnel trained in modern methods of health education and at the same time the necessity of concentrating all available personnel in the field for direct service rather than for production; (2) a great variance in quality of educational materials produced and in use by the various State and local health agencies, with regard to editorial and graphics presentation, educational techniques, and occasionally even scientific fact; and (3) the need for economy in terms of the greatest possible return on the investment.

With these facts revealed by special study and wide experience, the Division of Venereal Diseases established during the past year a consultation and advisory service for State and local health authorities, and took steps to increase materially the production facilities of all types of educational materials.

The consultation and advisory plan makes available trained workers who will collaborate, upon request, in the development of State and local activities. Services include field survey and recommendations, consultation and advice by correspondence, and assistance in meeting of special State or local problems where the matter is of special

national concern or the experience may be adapted more extensively.

A key unit in the plan is the Venereal Disease Education Circular, an administrative letter issued at intervals to inform State and local health officers of developments in venereal disease education, to announce policy, new publications, etc.

Since the passage of the Venereal Disease Control Act in 1938, the Division has followed a policy of mass production of educational materials for use by State and local health authorities. Some indication of the wide acceptance of the policy is gained from the accompanying table, indicating the distribution during the past 3 years of more than 4 million pieces of literature—of which almost $3\frac{1}{2}$ million pieces were sold, primarily to official health agencies.

The production service makes available professionally written and designed publications, posters, exhibits, radio, and motion picture materials. Scientific accuracy and uniformity is assured by critical examination of all materials by the foremost clinicians and health authorities of the Nation. Practical pedagogical, public relations, editorial, and graphics development is possible through use of the facilities not only of the Public Health Service, but of the entire Federal Government. Economy of production is fostered by mass production, and the growing tendency to eliminate the numerous State and local production units which attempt to perform similar work, also with Federal funds.

Research.—Yardsticks of problems and progress are essential to the sound development of any program. In the field of venereal disease education, qualitative factors outweigh quantitative ones, and the task of objective measurement is difficult. To provide such a measure, a Venereal Disease Education Evaluation Study was developed during the fiscal year 1940 in cooperation with the American Social Hygiene Association. An extensive testing of population groups was carried out at the New York World's Fair and at various State and county fairs and meetings throughout the Nation. Data have now been assembled and statistical procedures instituted which will be used as the basis of a series of reports on the effectiveness of the present program, and are expected to reveal important attitudes and opinions relating to social and public health problems involved in venereal disease control.

In cooperation with the American Social Hygiene Association, a survey of health education practices in relation to venereal disease instruction was carried out in some 30 States. The first of a series of reports has been published.

Publications.—Emphasis during 1941 has been on finding cases of syphilis and gonorrhea. Thus, the Venereal Disease Folder Series was rounded out with the publication of No. 4, "The Doctor Says . . .," illustrating the soundness of blood tests and physical examinations before marriage; and of No. 7, "Venereal Disease and National Defense," a leaflet on the vital necessity of community action to protect the military and industrial defense forces. A pictorial bulletin, "It Can Happen to You", was published.

Revisions, for publication early in 1942, were undertaken on Folders No. 1, "Syphilis—Its Cause, Its Spread, Its Cure"; No. 3, "You Can End This Sorrow"; No. 5, "Gonorrhea the Crippler"; and on Bulletin No. 93, "20 Questions on Gonorrhea." The manuscript for "A Book

About Syphilis" for lower economic and educational groups was completed.

As a special service to State health departments, a folder, "Arm Against Syphilis," was developed for use at the time of the first selective service registration in October of 1940. It was prepared in "mat" form for production by State and local health agencies, and was extensively used both at the first and second registration.

The number of educational publications distributed by both the Public Health Service and State departments of health has been steadily growing. The growth has been most marked since 1937, rising from a total of 1,168,085 to an estimated total for 1941 of 5,205,234. This figure can be considered as an index of general educational activity. While the rise appears great, when compared to the previous war period of 1918-19 (the total distribution then was 14,138,348) it becomes merely an indication of how much further the program must be developed.

Distribution of publications by the Division is indicated in the accompanying table. Requests for publications came to the administrative offices from 21,639 persons in all walks of life. Of the 387,992 publications distributed, 246,041 were from the popular series, the remainder professional. State health departments distributed an estimated 3,680,000 lay publications during the year.

Free and sales distribution of venereal disease folders, bulletins, and posters

Title	Date published	Free fiscal year 1941	Sales fiscal year 1941	Total distribution fiscal year 1941	Free since release	Sales since release	Total distribution since release
Venereal disease folders:							
No. 1—Syphilis, Its Cause, Its Spread, Its Cure.....	Mar. 1938	29,032	347,852	376,884	141,597	1,390,627	1,532,224
No. 2—Syphilis and Your Town.....	Dec. 1938	23,135	92,554	115,689	64,321	386,757	451,078
No. 3—You Can End This Sorrow.....	May 1939	20,219	82,443	102,662	73,218	425,920	499,138
No. 4—The Doctor Says.....	Apr. 1941	26,565	80,206	106,771	26,565	80,206	106,771
No. 5—Gonorrhea the Crippler.....	Aug. 1939	29,097	206,875	235,972	78,449	691,470	769,919
No. 6—Are You Being Played for a Sucker?.....	June 1940	25,836	191,716	217,552	98,649	210,154	308,803
No. 7—Venereal Disease and National Defense.....	Feb. 1941	62,251	100,500	162,751	62,251	100,500	162,751
Venereal disease bulletins:							
No. 93—20 Questions on Gonorrhea.....	Feb. 1940	3,736	82,977	86,713	45,614	107,916	153,530
No. 94—It Can Happen to You.....	Oct. 1940	13,856	57,096	70,952	13,856	57,096	70,952
Venereal disease posters:							
Nos. 7 through 14.....	-----	12,314	30,578	42,892	12,812	34,555	47,367
Total.....	-----	246,041	1,272,797	1,518,838	617,332	3,485,201	4,102,533

Graphics.—Major attention has been given to the development of effective case-finding posters, five of which were issued and three others sent to press. These are:

Venereal disease poster No. 10—Syphilis strikes 1 in 10 before 50.

11—A blood test for everyone.

12—Syphilis—treated and untreated mothers.

13—Know for sure—get a blood test for syphilis.

14—Make our men as fit as our machines.

15—No home remedy ever cured gonorrhea.

16—Prostitution spreads syphilis and gonorrhea.

7 (revised)—No home remedy or quack doctor ever cured syphilis or gonorrhea.

Distribution figures are given in the accompanying table. Rough designs were executed for two of a series of case-holding posters, planned for production in 1942.

Exhibits produced during 1940 were extensively utilized in many scientific and laymen's meetings. Three additional exhibits were prepared: "Syphilis—massive dose therapy," for the American Medical Association meeting in June; "Venereal Disease and National Defense," for the regional social hygiene and defense meetings in February; and a display of educational materials and techniques for the annual conference of State health officers.

Two series of photographs were added to the Public Health Service collection, one dealing with clinic organization and procedure, the other with use of educational materials. The policy of furnishing photographs illustrating venereal disease control methods and problems for use by magazines, newspapers, and other agencies was continued.

Motion pictures.—Distribution of previously available motion pictures was continued. A total of 93 loans were made of the films, "Syphilis—its nature, prevention, and treatment," "Syphilis of the central nervous system," and "Syphilis—a motion picture clinic." The semiprofessional sound production, "Three counties against syphilis," was shown 20,667 times. Three prints are now in circulation through State health departments, film depositories of the Department of Agriculture, and the Public Health Service.

Steps were taken during 1941 to replace the outmoded and inefficient films now in use. Production was virtually completed on a three-part color film, in sound, dealing with the diagnosis and management of syphilis. Arrangements were made with the Research Council of the Academy of Motion Picture Arts and Sciences to produce a film on the facts of syphilis for industrial defense use. The script was prepared for a film on community aspects of venereal disease, and production scheduled for early 1942. All films will be available to health authorities on a cost basis.

Radio.—In addition to periodic network "reports to the Nation," a plan of radio transcriptions has been developed as an aid to local control efforts. These have been prepared by special writers, produced through the facilities of the Radio Research Project of the Library of Congress, and distributed jointly by the Public Health Service and the Federal Radio Education Committee of the United States Office of Education.

Two series of recorded programs have been issued. Three 15-minute programs were released late in June 1940 and since that time have been carried by approximately 200 stations. The second series, two dramatic-type 15-minute programs, were released in April 1941. By August 1 they had been carried on 160 stations. The contribution of American broadcasters to venereal disease control has been impressive: The carrying of an important and personalized educational message 920 different times to an estimated audience of 10,000,000 persons.

Medical informational activities.—The core of the medical informative program continued to be the monthly scientific journal, "Venereal Disease Information." This publication contains, each month, several original articles and research papers in the fields of diagnosis,

treatment, and public health research, as well as a summary, in abstract form, of the important current scientific and other papers dealing with venereal disease and which appear in publications throughout the world. Reprints are available of original articles.

Venereal Disease Information retains its leadership in the field of government publications with paid circulations. Subscriptions for 1941 averaged 10,834, with a total monthly distribution of 17,012. A total of 203,548 copies was distributed, and more than 140,000 reprints and supplements. The availability of the journal has been called to the attention of all physicians through the cooperation of State health officers and State and county medical societies.

In addition to Venereal Disease Information, papers and exhibits on matters dealing with the diagnosis and management of venereal disease are presented before the various scientific assemblies. Previously mentioned, also, is the motion-picture film on syphilis which has been in production during the past year.

VENEREAL DISEASE MEDICAL CENTER, HOT SPRINGS NATIONAL PARK, ARK.

During the fiscal year activities of the Public Health Service Medical Center were broadened to emphasize the station's functions in venereal disease research and in training of public health officers. Two formal training courses consisting of lectures, laboratory sessions, and clinic demonstrations, each covering a period of several weeks, were conducted for the benefit of venereal disease control officials. Facilities of these courses were also made available to local physicians and medical officers of the Army and Navy General Hospital staff. Official registration for these and the informal clinic and laboratory observation courses totaled 44.

In-patient care, which previously had been limited to infectious or potentially infectious cases, was extended to medically indigent persons having chemotherapeutic resistant asymptomatic neurosyphilis. The comparative study of the toxicity of neoarsphenamine and sulfarsphenamine, which was begun in January 1940, was continued throughout the fiscal year 1941 with the administration of 5,469 additional doses of neoarsphenamine and 4,712 of sulfarsphenamine. A total of 10,000 injections of each drug will be studied in this investigation and as this number is rapidly being approached it is anticipated that the project will be completed early in the forthcoming fiscal year. Other studies undertaken during the year included an inquiry into the effects of roentgen ray on chemoresistant granuloma inguinale; clinical and laboratory observations on the Herxheimer phenomenon in early infectious syphilis; and a study of the possible protective influence of artificial hyperpyrexia on the toxicity of the arsphenamines.

During the year, 4,059 persons representing 42 States, the District of Columbia, and Bermuda applied for treatment at the Medical Center. Of these, 1,742 persons were admitted for the treatment of venereal diseases, including 1,168 cases of syphilis, 616 cases of gonorrhea, 41 cases of chancroid or Ducrey infection, 26 cases of lymphogranuloma venereum, and 7 cases of granuloma inguinale. Of the cases admitted, 31 departed before a diagnosis could be made

or were nonvenereal, and 147 patients presented multiple venereal infections at the time of admission.

A total of 46,111 routine treatments for venereal diseases was given, including 12,459 intravenous injections of arsenicals, 16,498 intramuscular injections of bismuth, 1,095 other injections such as tartar emetic, fuadin, etc., and 16,059 treatments for gonorrhea. In the dental clinic, 2,125 treatments were given. In furtherance of the established policy of assisting the National Park Service in its supervision of the Hot Springs thermal waters, clinicians and laboratory personnel of this station performed monthly examination of all registered bath attendants and applicants for bathhouse positions. Similarly, laboratory tests of the bacteria content of the waters of the commercial bathhouses were made periodically.

Work performed in the laboratories of the Medical Center during the fiscal year included 38,938 serologic tests for syphilis, 533 dark-field examinations, 447 intracutaneous tests, microscopic examination of 10,106 spreads for gonorrhea, 878 cultures for gonorrhea, 9,886 urinalyses, and 855 spinal fluids examined. The Medical Center again participated in the National Serodiagnostic Evaluation of Laboratories by contributing 4,480 specimens drawn from 80 local donors.

Information concerning 663 sources of infections and contacts and notifications concerning 152 delinquent patients who were considered potentially dangerous to the public health were sent to the proper health authorities. One hundred and twenty-nine replies concerning the source of infection and contacts and 34 replies concerning delinquent patients were received by this office indicating that appropriate action had been taken.

In the Medical Center infirmary, 872 patients received 20,564 days' hospital care. Thirty major and 267 minor surgical operations were performed; 16 infants were delivered of infected mothers; 99 patients received 455 fever sessions in the hypertherm cabinets; 84 patients were inoculated with therapeutic quartan malaria; and 40 blood transfusions were done.

MORBIDITY REPORTING

Clinics, private physicians, and State health authorities displayed a gratifying tendency to continue the increase in the number and the excellence of statistical reports. The clinics availing themselves of the mechanical tabulating facilities were in excess of 300 more than the 1,000 organizations which participated in the program during the preceding year.

There were approximately 495,000 cases of syphilis and 198,000 cases of gonorrhea reported to the several State and Territorial health departments during the year. The percentages of increase over 1940 in cases reported were, respectively, 1.5 and 10.0. The admissions to clinic services increased 18.0 percent for syphilis and 26.4 percent for gonorrhea.

Although the average monthly patient load and the number of treatments administered in clinics for syphilis increased by 32.1 and 28.2 percent, respectively, when compared with 1940, the corresponding reports for gonorrhea showed decreases of 12.8 and 16.4 percent.

There were 791 clinics treating venereal disease added to the 2,454 clinics reported for the preceding year.

The table of annual rates of syphilis in 43 cities of 200,000 population or over has been reincluded in this year's report. This shows Memphis, Tenn., with annual rates of 29.87 cases of syphilis and 1.97 cases of gonorrhea per 1,000 persons in the population, and Birmingham, Ala., with rates of 19.95 cases of syphilis and 2.33 cases of gonorrhea, at the top of the list of infected areas.

RECOMMENDATIONS

It is recommended that funds be made available to cope with the venereal diseases in national defense areas. The rate for syphilis in the Army was depressed as the result of inducting a large number of men free from syphilis and presumably free from gonorrhea in the early months of mobilization. Within a 6-month period, however, the rate has returned to the former rate in the regular Army. Funds are not yet adequate with which to develop the civilian program to an optimum level in national defense areas.

The program should seek the repression of prostitution, the follow-up and treatment of all discovered cases, and a further reduction in the attack rate for syphilis.

TABLE 1.—*Report of State and Territorial departments of health showing the number of cases of syphilis and gonorrhea reported, the annual rates per 1,000 inhabitants, the amount of arsphenamine distributed, and the laboratory examinations made from July 1, 1940, to June 30, 1941*

State	Number of cases			Annual rate of syphilis and gonorrhea per 1,000 inhabitants	Doses of arsphenamine distributed	Laboratory examinations		
	Total syphilis and gonorrhea	Syphilis	Gonorrhea			Serologic tests made	Microscopic examinations for <i>Spirochaeta pallida</i>	Examinations for gonococcus
Total.....	693,245	494,813	198,432	5.17	8,161,491	16,520,591	23,874	1,224,227
Alabama.....	26,838	21,616	5,222	9.47	468,410	416,196	454	23,519
Alaska.....	560	207	353	7.72	5,534	17,114	59	408
Arizona.....	3,332	1,870	1,462	6.67	30,610	159,278	29	6,755
Arkansas.....	13,109	11,259	1,850	6.72	161,388	208,052	952	12,323
California.....	43,708	22,883	20,825	6.33	512,307	606,139	1,441	125,457
Colorado.....	5,177	3,775	1,402	4.61	44,448	173,962	4	5,074
Connecticut.....	3,300	2,027	1,273	1.93	31,047	271,589	27	5,171
Delaware.....	2,003	1,543	460	7.52	23,218	46,444	44	3,585
District of Columbia.....	11,798	8,391	3,407	17.79	59,629	214,792	142	28,925
Florida.....	22,452	20,216	2,236	11.83	77,840	808,988	319	37,586
Georgia.....	22,395	20,960	1,435	7.17	485,092	295,164	305	8,730
Hawaii.....	1,888	803	1,085	4.46	17,883	55,976	56	2,349
Idaho.....	477	354	123	.91	12,225	104,598	66	4,623
Illinois.....	40,614	22,131	18,483	5.14	612,976	962,726	5,223	296,443
Indiana.....	8,718	6,766	1,952	2.54	50,562	575,910	4	11,930
Iowa.....	4,040	2,601	1,439	1.59	57,362	427,724	-----	6,552
Kansas.....	4,618	2,999	1,619	2.56	61,540	105,687	48	6,369
Kentucky.....	11,877	7,547	4,330	4.17	156,050	204,358	641	24,165
Louisiana.....	10,616	9,063	1,553	4.49	178,657	329,983	275	10,290
Maine.....	1,175	718	457	1.39	13,944	75,685	-----	4,406
Maryland.....	15,084	10,887	4,197	8.25	72,215	326,708	288	16,526
Massachusetts.....	8,517	4,613	3,904	1.97	152,075	409,467	6	31,290
Michigan.....	17,754	9,824	7,930	3.38	191,482	974,554	3,019	88,614
Minnesota.....	4,349	2,546	1,803	1.56	30,730	283,901	71	13,470
Mississippi.....	79,001	50,224	28,777	36.17	361,119	358,401	325	7,730
Missouri.....	13,044	9,391	3,653	3.45	80,271	147,290	30	12,131
Montana.....	570	338	232	1.02	16,607	76,005	23	2,768
Nebraska.....	1,850	960	890	1.41	11,271	140,999	3	3,613

TABLE 1.—Report of State and Territorial departments of health showing the number of cases of syphilis and gonorrhea reported, the annual rates per 1,000 inhabitants, the amount of arsphenamine distributed, and the laboratory examinations made from July 1, 1940, to June 30, 1941—Continued.

State	Number of cases			Annual rate of syphilis and gonorrhea per 1,000 inhabitants	Doses of arsphenamine distributed	Laboratory examinations		
	Total syphilis and gonorrhea	Syphilis	Gonorrhea			Serologic tests made	Microscopic examinations for <i>Spirochaeta pallida</i>	Examinations for gonococcus
Nevada.....	524	375	149	4.75	7,795	26,819	5	4,492
New Hampshire.....	450	308	142	.92	9,311	65,688	3	3,090
New Jersey.....	13,726	10,127	3,599	3.30	161,879	484,638	111	22,090
New Mexico.....	1,968	1,450	518	3.70	31,556	109,676	45	3,538
New York.....	61,915	42,449	19,466	4.59	421,525	2,177,055	2,855	130,682
North Carolina.....	25,527	20,167	5,360	7.15	641,858	750,614	3,228	27,914
North Dakota.....	814	393	421	1.27	7,268	79,940	8	2,726
Ohio.....	21,334	17,699	3,635	3.09	205,472	391,994	63	22,867
Oklahoma.....	12,818	8,501	4,317	5.49	196,305	297,922	513	17,959
Oregon.....	2,483	1,322	1,161	2.28	17,572	80,316	56	5,936
Pennsylvania.....	15,478	13,958	1,520	11.56	365,069	324,719	49	16,816
Puerto Rico.....	22,900	18,000	14,900	112.25	116,390	551,142	689	16,940
Rhode Island.....	1,627	1,124	503	2.28	24,260	165,283	47	9,441
South Carolina.....	19,854	18,562	1,292	10.45	277,369	440,094	620	24,478
South Dakota.....	838	584	254	1.30	5,344	68,568	-----	985
Tennessee.....	23,757	19,603	4,154	8.15	271,668	414,776	1,100	32,453
Texas.....	42,474	31,355	11,119	6.62	816,240	173,433	117	13,549
Utah.....	1,378	908	470	2.50	11,455	104,900	2	1,667
Vermont.....	402	174	228	1.12	9,638	18,056	4	1,513
Virginia.....	21,998	18,438	3,560	8.21	298,260	310,590	168	15,231
Virgin Islands.....	700	1500	1200	128.12	9,768	4,341	33	1,392
Washington.....	7,432	2,931	4,501	4.28	57,429	181,869	163	29,233
West Virginia.....	10,906	7,700	3,206	5.73	146,202	170,824	62	5,347
Wisconsin.....	2,262	1,216	1,046	.72	68,006	309,672	61	21,850
Wyoming.....	816	457	359	3.25	7,330	40,872	18	1,236

¹ Estimated.

TABLE 2.—*Report of 3,245 clinics, furnished through State health departments, July 1, 1940, to June 30, 1941*

State	New cases admitted during year					Monthly average number of patients under treatment					Total treatments for syphilis and gonorrhea	Doses of arsenphenamine administered	Doses of heavy metal administered
	Total, syphilis and gonorrhea	Syphilis			Gonorrhea	Total, syphilis and gonorrhea	Syphilis			Gonorrhea			
		Total all syphilis	Primary and secondary	Early latent			All early	Primary and secondary	Early latent					All early
Total	425,033	340,615	345,404	3104,208	3149,612	410,965	384,478	342,682	3101,531	26,487	11,373,423	4,885,736	5,775,523
Alabama	23,458	19,987	1,804	7,218	9,022	17,344	16,066	1,844	6,862	61,278	451,409	221,323	215,117
Alaska	1,833	1,316	207	350	557	1,405	1,265	158	244	140	47,492	18,341	25,221
Arizona	9,686	8,576	1,647	3,066	4,713	5,862	5,669	1,232	1,668	2,900	293,222	97,230	107,524
Arkansas	24,195	15,565	1,573	2,764	4,337	21,763	18,648	1,684	3,015	4,699	780,885	432,217	313,037
California	1,869	1,141	165	176	341	1,918	1,631	373	129	287	63,606	19,751	33,314
Colorado	1,719	1,282	(1)	(1)	(1)	1,554	1,383	(1)	(1)	(1)	171	46,742	15,383
Connecticut	1,253	950	142	318	400	1,373	1,304	77	442	519	69	39,019	17,224
Delaware	7,151	4,910	793	1,490	2,283	7,271	6,127	912	1,689	2,601	1,144	143,929	52,415
District of Columbia	18,318	17,295	1,774	5,911	7,685	8,552	8,319	766	2,882	3,648	233	288,969	136,344
Florida	23,330	22,278	2,436	12,170	14,606	21,962	21,718	2,042	10,981	13,023	244	561,002	298,756
Georgia	922	766	63	93	156	771	740	39	184	223	31	26,617	13,546
Hawaii	166	117	20	28	48	101	93	18	22	40	8	3,704	1,589
Idaho	19,792	9,963	972	1,473	2,445	24,273	21,379	1,637	3,498	5,155	2,894	657,650	150,895
Illinois	6,340	4,868	1,029	777	1,806	6,106	5,324	458	1,414	1,872	198,246	72,235	106,474
Indiana	500	298	46	48	94	202	545	498	88	143	47	19,275	5,883
Iowa	2,355	1,647	248	526	774	2,119	1,958	393	363	756	161	76,468	28,915
Kansas	10,163	6,851	1,244	1,860	2,804	11,886	11,002	2,115	2,293	4,408	285,505	118,533	104,024
Kentucky	13,992	13,396	1,876	4,288	6,164	10,096	10,053	1,049	2,490	3,539	43	303,552	140,156
Louisiana	1,013	577	96	138	234	745	620	71	148	219	125	25,739	10,971
Maine	7,360	5,727	948	1,775	2,723	7,164	6,207	1,296	1,906	3,202	897	195,806	90,447
Maryland	4,300	2,547	225	72	297	4,833	5,635	(1)	(1)	1,007	1,003	190,176	62,893
Massachusetts	7,580	3,541	615	908	1,523	7,232	6,031	861	1,064	1,925	1,203	170,973	61,563
Michigan	1,049	594	37	78	115	2,956	2,468	186	246	432	488	58,832	18,267
Minnesota	23,084	22,416	2,488	8,759	11,247	15,943	15,877	1,869	6,055	7,924	66	521,427	256,589
Mississippi	12,784	9,032	1,032	2,632	3,664	15,943	8,139	931	2,311	3,242	862	256,894	94,969
Missouri	82	37	7	4	11	78	69	1	7	8	9	2,565	1,471
Montana	1,042	627	93	178	271	697	585	71	138	209	112	24,604	8,002
Nebraska	85	74	2	6	8	81	79	10	3	2	3,354	1,616	1,698
Nevada	134	99	7	10	17	35	258	10	9	13	9,480	3,149	5,911
New Hampshire	7,191	5,215	461	1,195	1,656	11,743	10,907	598	1,791	2,389	836	76,865	157,498
New Jersey	894	127	64	170	231	1,004	954	50	158	217	32,836	14,349	17,764
New Mexico	894	127	64	170	231	1,004	954	50	158	217	32,836	14,349	17,764
New York	19,245	17,837	1,155	2,944	4,099	34,758	34,221	1,896	4,787	857	776,241	279,092	473,426

North Carolina.....	29,763	24,750	5,697	10,200	13,897	5,013	36,940	35,435	3,240	15,562	18,802	1,505	875,528	426,723	426,310
North Dakota.....	7,288	7,288	(¹)	(¹)	(¹)	(¹)	7 11,926	11,926	1,723	1,761	3,484	(¹)	1,028	460	300
Ohio.....	7,185	5,392	842	1,746	2,588	1,793	5,934	5,426	766	1,568	2,334	508	283,586	116,385	167,001
Oklahoma.....	992	690	111	147	258	293	1,800	1,687	263	277	542	119	187,117	86,871	88,342
Oregon.....	12,942	11,688	1,170	3,085	4,255	1,254	20,950	20,437	1,761	3,334	5,098	513	36,732	14,908	18,887
Pennsylvania.....	21,213	16,313	2,977	3,874	6,851	4,900	12,255	11,328	1,520	2,503	4,023	927	488,505	197,669	275,284
Puerto Rico.....	501	378	39	94	133	123	1,076	939	44	95	139	137	386,801	150,309	195,475
Rhode Island.....	14,569	13,989	2,805	4,234	7,039	980	9,030	8,866	1,258	2,086	3,344	164	22,442	7,883	11,061
South Carolina.....	18,254	15,286	2,255	4,856	7,111	2,968	18,160	16,778	1,762	5,840	7,602	1,382	454,036	219,349	208,885
Tennessee.....	34,906	26,749	4,272	7,909	12,181	8,157	27,223	25,358	3,827	6,539	10,366	1,865	931,105	374,094	490,419
Texas.....	308	203	12	30	42	105	340	309	8	40	48	31	11,596	4,761	6,091
Utah.....	12,560	10,990	1,590	3,384	4,974	1,570	11,318	10,523	(¹)	(¹)	(¹)	795	322,542	160,103	155,469
Vermont.....	2,743	1,381	181	288	469	1,362	1,990	1,698	298	262	560	322	77,193	26,428	35,864
Virgin Islands.....	6,104	4,454	1,332	1,170	2,502	1,650	6,338	5,916	1,447	1,560	3,007	422	189,937	87,070	93,348
Washington.....	970	672	30	116	146	298	2,408	2,342	58	428	486	64	37,761	13,544	33,511
West Virginia.....	101	75	7	30	37	26	43	38	5	13	18	5	1,754	844	798
Wisconsin.....															
Wyoming.....															

¹ No clinics, or not reporting.² Estimate based on 3 months.³ Estimate based on States reporting by diagnosis.⁴ Diagnostic break-down not available.⁵ Estimate based on 1 month.⁶ Estimate based on 8 months.⁷ Not reporting gonorrhea.⁸ Does not include New York City.

TABLE 3.—*Statistical summary of activities in the control of the venereal diseases for the fiscal years 1938-41*

	1941	1940	1939	1938
<i>Medical activities</i>				
A. Cases of venereal disease reported to State health departments:				
I. Syphilis.....	494, 813	487, 464	485, 967	480, 140
II. Gonorrhea.....	198, 432	180, 383	184, 679	198, 439
Total.....	693, 245	667, 847	670, 646	678, 579
B. Doses of arsphenamine distributed by State health departments.....	8, 161, 491	6, 895, 837	4, 677, 757	2, 799, 110
C. Clinics:				
I. Clinics reporting to State health departments.....	3, 245	2, 454	2, 085	1, 122
II. Report from clinics:				
a. New cases admitted.....	425, 023	355, 589	314, 594	197, 303
b. Treatments given.....	11, 373, 423	9, 165, 490	7, 923, 958	5, 177, 827
c. Doses of arsphenamine administered.....	4, 855, 736	3, 719, 880	3, 166, 342	1, 854, 735
<i>Educational activities</i>				
A. Publications:				
I. Requests for publications received by the Division.....	21, 639	20, 885	19, 528	14, 673
II. Publications distributed:				
a. By the Division to State health departments and others.....	387, 992	385, 871	244, 290	198, 784
b. By State health departments.....	4, 158, 008	3, 324, 358	2, 462, 206	2, 480, 797
Total.....	4, 546, 000	3, 710, 259	2, 706, 496	2, 679, 581
III. Venereal disease publications issued by the Public Health Service.....	36	27	27	25
B. Number of venereal disease publications sold by Government Printing Office.....	1, 242, 219	1, 402, 490		
C. Motion picture films lent by the Division.....	241	628	118	173
D. Posters distributed.....	42, 892	5, 460	618	3, 138

TABLE 4.—*Report of cooperative clinic activities furnished through State health departments from 1919 to 1941*

Year	Number of clinics reporting	New cases admitted	Total treatments given	Treatments per new case admitted
1919.....	167	59, 092	527, 392	8. 92
1920.....	383	126, 131	1, 576, 542	12. 50
1921.....	442	140, 748	2, 108, 003	14. 98
1922.....	541	141, 279	2, 045, 232	14. 48
1923.....	513	119, 217	1, 992, 631	16. 71
1924.....	504	118, 023	2, 147, 087	18. 19
1925.....	495	110, 372	2, 088, 494	18. 92
1926.....	416	100, 776	1, 881, 380	18. 67
1927.....	425	107, 688	1, 964, 233	18. 24
1928.....	451	110, 756	2, 174, 832	19. 64
1929.....	445	120, 315	2, 128, 417	17. 69
1930.....	477	127, 978	2, 547, 162	19. 90
1931.....	512	143, 982	2, 847, 024	19. 77
1932.....	533	150, 906	2, 979, 730	19. 75
1933.....	572	154, 302	3, 263, 927	21. 15
1934.....	616	129, 293	3, 085, 401	23. 86
1935.....	656	134, 720	3, 359, 632	24. 94
1936.....	713	126, 271	3, 344, 257	26. 48
1937.....	965	149, 472	3, 757, 770	25. 14
1938.....	1, 122	197, 303	5, 177, 827	26. 24
1939.....	2, 085	314, 594	7, 923, 958	25. 19
1940.....	2, 454	355, 589	9, 165, 490	25. 78
1941.....	3, 245	425, 033	11, 373, 423	26. 76

TABLE 5.—*Budgetary allocation of Federal funds appropriated under the Venereal Disease Control Act for the fiscal year 1941 (as of July 10, 1941)—Continued*

State	Total allotted	Total pay- ments	Total bud- geted	Purposes for which budgeted							
				Adminis- tration	Consultation and techni- cal informa- tion	Public edu- cation	Case-finding and case- holding	Laboratory	Treatment facilities	Drugs	Training
Oregon	\$35,000.00	\$35,000.00	\$36,200.42	\$300.00	\$5,883.00	-----	\$4,480.00	\$5,040.00	\$13,591.99	\$3,954.93	\$2,950.50
Pennsylvania	328,000.00	327,500.00	336,830.62	12,975.00	22,893.50	-----	55,533.50	27,850.00	147,218.68	35,614.94	27,305.00
Rhode Island	27,000.00	21,220.00	34,824.00	3,660.00	19,900.00	-----	750.00	16,914.00	5,500.00	7,500.00	-----
South Carolina	136,400.00	136,400.00	141,637.24	6,975.00	19,998.00	574.00	5,399.17	14,810.00	60,039.08	33,841.99	-----
South Dakota	31,000.00	29,710.50	36,144.48	1,380.00	1,500.00	5,700.00	150.00	16,218.23	7,896.25	3,090.00	300.00
Tennessee	165,500.00	165,500.00	189,675.06	1,140.00	3,772.50	-----	5,718.08	33,020.92	104,293.40	36,475.16	5,255.00
Texas	327,900.00	327,900.00	361,720.34	4,500.00	17,289.88	4,992.10	52,708.70	47,090.58	169,051.85	60,776.23	4,710.00
Utah	22,100.00	22,100.00	26,225.34	975.00	2,442.34	1,487.00	2,010.00	7,430.00	5,385.00	6,170.00	326.00
Vermont	15,600.00	15,600.00	17,623.26	1,200.00	5,900.00	-----	1,800.00	600.00	5,000.00	3,723.26	-----
Virginia	156,160.00	156,160.00	177,249.70	14,145.04	21,113.28	1,062.50	3,900.00	13,902.50	95,126.38	28,000.00	2,378.66
Washington	70,300.00	70,300.00	81,957.28	3,791.34	5,490.32	6,840.00	9,207.68	11,855.76	27,394.12	15,000.00	1,510.00
West Virginia	76,900.00	76,900.00	91,494.02	1,930.00	5,170.00	3,625.00	985.00	20,920.00	37,554.02	19,800.00	-----
Wisconsin	98,406.00	82,225.00	126,629.47	5,100.00	13,525.00	4,200.00	20,815.00	14,821.75	40,167.72	22,000.00	-----
Wyoming	10,500.00	4,671.11	7,690.00	-----	-----	-----	-----	780.00	5,145.00	1,705.00	700.00
Puerto Rico	111,100.00	111,100.00	114,960.98	6,620.00	11,143.15	1,797.50	18,415.00	5,998.34	65,658.99	4,628.00	-----
Virgin Islands	3,718.00	3,718.00	3,865.74	-----	150.25	-----	-----	5,970.00	1,010.00	1,725.49	-----

TABLE 6.—*Domestic sales of arsenical drugs, estimated in number of doses, during the calendar years 1933 to 1940, inclusive, as reported by manufacturers and distributors (revised as of Mar. 31, 1941)*

Calendar year	Number of doses sold, ¹	Calendar year	Number of doses sold ¹
1933-----	5,767,278	1937-----	10,348,644
1934-----	6,769,338	1938-----	11,247,762
1935-----	6,521,312	1939-----	13,001,615
1936-----	7,717,953	1940-----	13,371,490

¹ Estimated on basis of 0.3 gm. average dose of arsphenamine (salvarsan); 0.2 gm. average dose of silver arsphenamine, sulfarsphenamine, neosilverarsphenamine, etc.; 0.5 gm. average dose of neoarsphenamine; 0.05 gm. average dose of mapharser; 0.5 gm. average dose of trisodarsen; 0.2 gm. average dose of bismarsen; 3.0 gm. average dose of tryparsamide.

TABLE 7.—*Annual rates per 1,000 population for syphilis and gonorrhea in 43 cities with a population of 200,000 or over, as reported by the city health officers for the months July 1940 to June 1941, inclusive*

City	Annual rates per 1,000 population		City	Annual rates per 1,000 population	
	Syphilis	Gonorrhea		Syphilis	Gonorrhea
Akron, Ohio-----	3.26	1.18	Minneapolis, Minn-----	1.42	1.03
Atlanta, Ga-----	15.13	1.67	Newark, N. J-----	5.67	2.43
Baltimore, Md-----	8.73	3.02	New Orleans, La-----	1.94	1.39
Birmingham, Ala-----	19.95	2.33	New York, N. Y-----	3.99	1.97
Boston, Mass-----	2.07	1.52	Oakland, Calif-----	2.50	2.32
Buffalo, N. Y-----	2.60	1.25	Oklahoma City, Okla. ² -----	6.50	3.21
Chicago, Ill-----	3.56	3.71	Omaha, Nebr-----	1.91	1.66
Cincinnati, Ohio-----	6.40	3.40	Philadelphia, Pa-----	3.34	.16
Cleveland, Ohio-----	3.53	1.69	Pittsburgh, Pa-----	9.04	.45
Columbus, Ohio-----	3.87	.93	Portland, Oreg-----	2.11	2.05
Dallas, Tex-----	12.14	5.98	Providence, R. I-----	2.57	1.10
Dayton, Ohio-----	4.03	1.49	Rochester, N. Y-----	.95	1.33
Denver, Colo-----	5.71	2.74	San Diego, Calif. ³ -----	5.03	7.85
Detroit, Mich-----	3.58	2.68	St. Louis, Mo-----	8.83	2.93
Houston, Tex. ¹ -----	8.57	4.34	St. Paul, Minn-----	1.28	.96
Indianapolis, Ind-----	3.22	1.64	San Antonio, Tex-----	8.04	3.04
Jersey City, N. J-----	1.51	.43	San Francisco, Calif-----	4.01	4.02
Kansas City, Mo-----	1.36	1.74	Seattle, Wash-----	3.79	5.26
Los Angeles, Calif-----	4.53	3.66	Syracuse, N. Y-----	4.16	.48
Louisville, Ky-----	6.15	3.75	Toledo, Ohio-----	2.39	1.18
Memphis, Tenn-----	29.87	1.97	Washington, D. C-----	12.65	5.14
Milwaukee, Wis-----	.96	.34			

¹ Estimate based on actual reports for 9 months.

² Estimate based on actual reports for 6 months.

³ Estimate based on actual reports for 7 months.

TABLE 8.—*Report of U. S. Public Health Service Clinic at Hot Springs National Park, Ark., from July 1, 1940, to June 30, 1941*

Total applicants-----	4,059	Gonorrhea-----	622
Admitted ¹ -----	1,742	New cases-----	562
Ineligible-----	2,171	Readmitted-----	54
Did not return ² -----	146	Rejected-----	6
Syphilis-----	1,247	Syphilis (new cases)-----	1,004
New cases-----	1,004	Primary-----	63
Readmitted cases-----	164	Secondary-----	195
Rejected-----	79	Tertiary-----	615
		Neuro-----	118
		Congenital-----	13

¹ Represents 1,889 cases of venereal diseases, i. e., 147 patients with 2 or more infections.

² Did not return for physical examination.

TABLE 8.—*Report of U. S. Public Health Service Clinic at Hot Springs National Park, Ark., from July 1, 1940, to June 30, 1941—Continued*

Total treatments given.....	97, 133	Laboratory examinations—Con.	
Arsenicals.....	12, 459	Kahn quantitative precipi-	1, 381
Heavy metal.....	16, 498	tation.....	4, 718
Other intravenous.....	1, 095	Kahn presumptive tests....	3, 390
Gonorrhea.....	16, 059	Icterus indices.....	533
Baths.....	51, 022	Darkfields.....	10, 106
		Gonococcus spreads.....	9, 886
Laboratory examinations.....	64, 630	Urinalyses.....	225
Complement fixation tests..	13, 706	Frei tests.....	222
Precipitation tests.....	19, 133	Chancroid tests.....	878
		G. C. cultures.....	452
		Special tests.....	855
		Spinal fluid examinations....	

TABLE 9.—*Report of United States Public Health Service Clinic at Hot Springs National Park, from July 1, 1940, to June 30, 1941*

Year	Number of applicants	Number of cases			Treatments given ¹
		Total venereal disease patients	Syphilis	Gonorrhea	
Total.....	109, 108	76, 586	27, 555	27, 003	1, 661, 553
1922.....	2, 720	1, 775	1, 182	593	43, 830
1923.....	3, 389	1, 854	1, 326	528	41, 559
1924.....	3, 676	2, 186	1, 447	739	50, 683
1925.....	3, 411	2, 782	2, 011	771	50, 608
1926.....	3, 570	3, 064	2, 211	853	54, 590
1927.....	4, 757	3, 682	2, 504	1, 178	58, 489
1928.....	5, 467	4, 134	2, 626	1, 508	72, 466
1929.....	5, 265	3, 986	2, 512	1, 474	75, 519
1930.....	5, 704	4, 441	2, 743	1, 698	79, 180
1931.....	4, 881	5, 088	2, 776	2, 312	66, 246
1932.....	5, 106	6, 184	3, 188	2, 996	93, 707
1933.....	4, 036	4, 485	2, 850	1, 635	73, 466
1934.....	6, 682	5, 607	3, 330	2, 277	124, 004
1935.....	14, 946	8, 032	5, 272	2, 760	198, 051
1936.....	8, 490	4, 630	3, 368	1, 262	141, 446
1937.....	6, 806	4, 217	2, 974	1, 243	110, 336
1938.....	6, 209	3, 664	2, 863	1, 078	108, 337
1939.....	5, 272	2, 743	2, 074	797	101, 169
1940.....	4, 662	2, 290	1, 702	685	71, 756
1941.....	4, 059	1, 742	1, 168	616	46, 111

¹ Baths not included.

DIVISION OF MENTAL HYGIENE

Assistant Surgeon General LAWRENCE KOLB in charge

The Division of Mental Hygiene has continued to carry out the functions imposed upon it by law.

STUDIES OF THE NATURE AND TREATMENT OF DRUG ADDICTION

Research into the nature and treatment of drug addiction was continued at the United States Public Health Service Hospital, Lexington, Ky.

Studies of the influence of prostigmin upon the addiction action of morphine were concluded. This cholinergic drug was found to have no deterrent effect on the ability of morphine to cause physical dependence, and to have no beneficial effect on the abstinence syndrome. Studies by the Wolff-Hardy technique for measuring analgesia failed to show that prostigmin improved analgetic power of morphine.

The reaction of post-addicts to morphine as measured by the Wolff-Hardy technique was found to be quite different from that of persons who have never been addicted. This suggests that addiction may cause certain irreversible changes, but the physiological level at which these changes might take place is not indicated.

Further work on this phenomenon is in progress. In using this technique it has been learned that concomitant with the experience of pain, an exaggeration of the galvanic skin response occurs. This gives a method of measuring objectively the point at which pain is experienced. It was found that a parallel method could be used in measuring pain threshold in animals, namely a reflex muscular "twitch," which occurs in dogs at about the same intensity of stimulus which causes pain in man. By the use of this threshold indicator, it was found that morphine, codeine, dilaudid, and aspirin cause the same general type of analgesia in dogs as they do in man.

An investigation of the new synthetic analgetic (1-methyl-4-phenyl piperidine-4-carbonic acid ethyl ester hydrochloride), known in Europe as Dolantin, was undertaken with a view of assaying its addiction (physical dependence) liability. It was found that in certain patients this substance can be substituted for morphine with reasonably adequate satisfaction, and that, following its withdrawal 10 days later, abstinence phenomena occur. The duration of the action of this compound is quite short, and its subjective effects are described as being more akin to alcohol than to morphine. Preliminary study seems to indicate that this substance possesses addiction liability both as to physical and psychic dependence, and that this quality is of an order somewhat lower than that of codeine.

Further studies of the abstinence syndrome indicate that patients studied during the past 2 years were less intensely addicted than were those studied 4 or 5 years ago. An investigation of the relationship between the abstinence syndrome intensity and the amount of morphine required for stabilization showed that the abstinence syn-

drome intensity increases approximately as the cube root of the daily stabilization dose.

An intensive study of the several sequential stages of addiction and recovery was completed. The results show that during addiction, body water, water content of blood, blood sedimentation, carbohydrate intake, body temperature, nocturnal activity, and urinary glucuronic acid were increased, whereas body weight, hemoglobin, packed cell volume, pulse rate, basal metabolism, and blood pressure were decreased. The scope of the studies of blood volume and extracellular water have been broadened. In some instances a slight increase in blood volume has been found to result from a single dose of morphine.

Studies of the cholinesterase concentration of blood serum indicate that in a normal person it is reduced by the injection of prostigmin, but in certain homosexual patients a slight increase occurs. Slight increases in cholinesterase concentration have been found during addiction but following withdrawal the concentration of this enzyme falls, then returns to normal levels. The acute effect of morphine on cholinesterase concentration is being investigated.

Further progress has been made in studies of the fate in the human body of morphine and its derivatives. These have concerned the nature of the product with which morphine is conjugated, the site of conjugation in the body, and the portions of the morphine molecule involved. The fact that the glucuronic acid content in urine increases beyond the normal range proportionate to increases in morphine dosage, and the fact that morphine possesses a phenolic hydroxide strongly suggest that one of the conjugated products may be morphine-glucuronic acid or a glucurone. Accordingly, a considerable quantity of glucuronic acid has been prepared and furnished to the Division of Chemotherapy of the National Institute of Health for the preparation of morphine-glucuronic acid. When this product becomes available, its nature and action will be studied.

Since it is possible that another conjugate of morphine may be its ethereal sulfate, a sample of this substance has been studied. It was found that, although it will relieve withdrawal symptoms and satisfy physical dependence, it does not produce analgesia. It is excreted mainly in the bound form, little of it being broken down to free morphine in the body.

Improvement in the method of analysis of morphine in various biological materials made it sufficiently sensitive to detect this drug in amounts from 0.03 to 0.2 mg. It was found that feces, liver, and perspiration contain free morphine; bile, however, contains only bound morphine; both free and bound morphine are found in urine and gastric juice. The absence of free morphine in the bile suggests that conjugation may take place in the liver.

Through studies of the excretion of morphine derivatives having methyl groups on either or both the alcoholic and phenolic types of hydroxyl, it has been established that conjugation required the presence of one of these hydroxyl groups.

With regard to the question of the fate of heroin in the human body, it has been found to be excreted as morphine. The amount of free morphine excreted in the urine of patients after the substitution of heroin for morphine is the same as before, even though the substitute dose of heroin is but one quarter that of morphine. The percentage excretion, however, is considerably higher during heroin

administration, and the amount of bound morphine found during heroin administration is slightly less than during the period of morphine administration. From this it might be inferred that the portion of the alkaloid destroyed or so altered as to defy detection by the methods used might be that which supports and satisfies addiction.

Psychological studies of morphine addiction have yielded the following results: Addiction is associated with a decrease in the electrodermal response to word stimuli, and the hand and voice response times are lengthened. The threshold of sensitivity to electric current is increased. These findings indicate a lowering of the reactivity level and slowing of responses to peripheral and ideational stimuli. Other studies, such as the Johnson Code learning test, suggest that morphine addiction is associated with a decrease in efficiency. Slowing of the tapping speed and errors in continuous subtraction tend to substantiate this view. Withdrawal of morphine results in a hyper-reactive state, followed by a return to approximate normality.

A comparison of post-addicts with normal controls has been made with reference to a variety of psychometric measures. The following significant differences were obtained: While the speed of performance of post-addicts was greater than that of controls, post-addicts showed diminished ability to change rapidly from one type of mental process to another.

A study of the personality configuration of addicts by means of the Rorschach test has been initiated. Preliminary work suggests that there is probably not a clear-cut "addiction personality," although a number of the tests show definite deviations from so-called normal responses. For example, some examinations made on poorly educated, semiskilled workers have shown a rich capacity for inner living, which is seldom found in this socioeconomic class. Others have shown strong intellectual drives out of proportion to their mediocre capacities. These varied results and other findings such as excessive development of sexual drive, psychoneurotic structure, depression, and personality construction have made it necessary to place major emphasis upon the development of more adequate control norms in order to evaluate properly the results of studies on addicts.

Studies are being made to determine whether there is any correlation between electroencephalographic results and those obtained from the Rorschach test.

Previous studies with the electroencephalograph have indicated that the primary effect of morphine is not upon the cerebral cortex. Work has therefore been started on a new study with the use of an electrode placed in the nasopharynx for the purpose of recording activity from the region of the diencephalon. Results of this study are as yet inconclusive.

At the suggestion of Dr. William Washington Graves, of the St. Louis University Medical School, studies were undertaken of the scapular types of a series of drug addicts. The findings on addicts correspond quite closely to normal values established by Dr. Graves, thus supporting previous anthropometric studies indicating that the body build of the addict is normal.

DISSEMINATION OF INFORMATION

Reports on the results of studies of drug addiction were presented before the following societies: The Southern Psychiatric Association,

the Association of Military Surgeons, the American Chemical Society, the Federation of the American Societies of Experimental Biology, and the Southern Medical Association.

Talks on the aspects of drug addiction as a medical and sociological problem were presented to medical groups, service clubs, and various civic organizations. The Tarrant County (Tex.) Medical Society and the Texas Neurological Society each held a special meeting at the United States Public Health Service Hospital at Fort Worth, Tex., and on each occasion the members of the staff presented a scientific program consisting of case demonstrations and papers.

Exhibits of the activities of the Public Health Service Hospital at Lexington, Ky., were presented at the meetings of the American Psychiatric Association, the Kentucky State Medical Association, and the Southern Medical Association.

The following articles relating to the work of the Division on drug addiction were published in both Service and outside publications: Free and Bound Morphine in the Urine of Morphine Addicts, by Fred W. Oberst; The Relation of Body Build to Drug Addiction, by Ralph R. Brown; Thiamine in the Treatment of the Morphine Abstinence Syndrome in Man, by C. K. Himmelsbach; The Effects of Certain Chemical Changes on the Addiction Characteristics of Drugs of the Morphine, Codeine Series, by C. K. Himmelsbach; Physician Drug Addicts, by M. J. Pescor; Drug Addiction: The Nursing Approach to Treatment, by J. D. Reichard, Myrtice C. Gupton, and John C. Buchanan; The Electrolytic Dissociation of Morphine Derivatives and Certain Synthetic Analgetic Compounds, by Fred W. Oberst and Howard L. Andrews; Physiological Investigations in Drug Addiction, by Edwin G. Williams; The Excretion of Morphine in Morphine Addicts, by Fred W. Oberst; Biophysical Studies of Drug Addiction, by Howard L. Andrews; Psychological Investigations in Drug Addiction, by Ralph R. Brown; The Search for a Non-Addictive Substitute for Morphine, by C. K. Himmelsbach; Prognosis in Drug Addiction, by M. J. Pescor; Attitude of Drug Addicts and Personnel Toward Hospital Policies, by M. J. Pescor; and An Economical Method of Heat Control in Warm Climates, by J. D. Reichard.

A number of other articles dealing with the subject of drug addiction have been approved for publication.

STUDIES OF THE ABUSIVE USES OF AND THE MEDICINAL AND SCIENTIFIC NEEDS FOR NARCOTIC DRUGS

There has been a definite decrease in admissions to the Public Health Service narcotic hospitals during the past year, which seems to indicate a reduction in the abusive use of narcotic drugs. This reduction appears to be chiefly the result of a scarcity of narcotic drugs in the illicit trade throughout the country, which in turn is due mainly to the war activities with the resultant decrease in supplies and opportunities for smuggling.

HOSPITALS FOR DRUG ADDICTS

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL, LEXINGTON, KY.

The activities at this hospital included, in addition to the special research studies on the nature and treatment of drug addiction, the clinical and psychiatric care of patients, the operation of vocational

therapy projects, embracing agricultural and mechanical activities, garment manufacturing, etc., and the maintenance of the physical plant.

The work of the clinical division has continued along lines similar to those in previous years, but with certain improvements and extensions of activities.

One of the important improvements occurring during the year was the creation of a social service department and the employment of a director of social service. This department has furnished valuable assistance to the clinical division in the preparation of social histories on incoming patients and of parole and conditional release plans for prisoner patients. An important function of the department has been to serve as a liaison between patients and their home communities for the purpose of preparing the community for the reception of the discharged addict. As a part of this work, satisfactory working relationships have been established with many of the larger social agencies in various cities throughout the country.

An educational director was added to the staff. He has been engaged in developing a department of education, largely by the utilization of patient teachers. It is felt that this arrangement will not only benefit the pupils but will be particularly beneficial to those patients serving as teachers. This educational program has been received with great enthusiasm by the patients, even though the studies must be conducted during their spare time and the school work cannot be used as a method of evading a regular vocational assignment. The use of aptitude tests has been begun by this department. Through these the training of patients can be directed along lines for which they are best fitted.

The practice of granting leaves to voluntary patients has been continued, and through the cooperation of local probation officers leaves in certain cases have been granted to probationary patients.

The practice of granting trustyship to as many of the patients as seem to deserve it was continued, and at the end of the year nearly 50 percent of the patients had that status.

A new wing for the treatment of "informer" patients was opened during the year. This is a self-contained unit, comprising three floors of double rooms with a separate kitchen and dining room, and an entrance entirely separate from that to the rest of the institution. This enables this type of patient to be housed quite comfortably with a minimum of contact with the other patients of the institution.

There was a reduction of the ratio of probationer patients to all court cases, as compared with the previous year. It is felt that this method should be used much more extensively by courts.

There has been a considerable decrease in the number of admissions as compared with the previous year (total number of patient-days for the previous fiscal year, 371,166; this fiscal year, 308,341.) This seems to be a reflection of the scarcity of narcotic drugs in illicit channels, resulting from the war.

Follow-up studies on 3,709 patients discharged from the Lexington hospital prior to December 31, 1940, resulted as follows: Cured, 18.1 percent; relapsed, 21.8 percent; questionable, 10.0 percent; deceased, 6.5 percent; in the institution or discharged less than 6 months previously, 9.4 percent; unknown, 34.2 percent. All indi-

viduals out of the institution less than 6 months have been excluded from the tabulation, and all those not definitely known to have refrained from the use of drugs have been placed in the category of "questionable." The number of "unknowns" has increased, due partly to loss of contact and partly to inability, because of legal restrictions, to obtain information on former voluntary patients from anyone except the patient. However, a considerable number of these "unknowns" must be abstaining from the use of drugs, else they would have gotten into difficulties and have been reported to the hospital through the Federal Bureau of Investigation.

A method of follow-up on patients living not too far from the institution has been developed. By this method a discharged patient may be readmitted for 1 or 2 days' observation at regular intervals of 3 or 4 weeks, at which time his adjustment is discussed with him and the urine is examined for morphine. It appears that the knowledge that this follow-up is to be made is helpful to certain patients in enabling them to refrain from returning to the use of drugs. It is unfortunate that, because of difficulties of transportation to and from the institution, the system cannot be extended more widely.

Progress was made during the year on a plan of extensive and intensive codification and analysis of data on drug addicts, which it is hoped will throw new light on the epidemiology of this condition. Arrangements have been made to combine the data of this institution with that of the Fort Worth hospital, thus giving a more accurate picture of the drug addicts in the country as a whole.

The maintenance department, in caring for the plant, continued to provide an excellent opportunity for vocational training for patients. The work included landscaping, building of roads and sidewalks in the neighborhood of the new quarters and the new women's building, together with repairing and maintenance of existing roads.

The industries operating under the working capital fund also continued to afford excellent opportunities for rehabilitation training. A new activity under the working capital fund was initiated, that of the furniture and woodworking industry. Equipment was purchased, a master cabinet maker employed as head of this activity, and production started.

UNITED STATES PUBLIC HEALTH SERVICE HOSPITAL, FORT WORTH, TEX.

The operation of the Fort Worth hospital followed very closely the plan of operation of the Lexington hospital, with a minimum of emphasis on custodial features.

During the year 757 patients were admitted to the hospital and 849 were discharged, leaving a population of 619 at the close of the fiscal year. The average daily census was 715.8.

The type of patient entering the hospital seemed to be changing toward the group representing more marked and more fixed personality defects. This made an unfavorable prognosis more common and by the same token increased the need for more treatment per individual. The decrease in hospital population provided an opportunity for more attention to the individual patient and this, coupled with increasing experience on the part of the physicians on the staff, made possible a wider application of psychotherapy of both direct and indi-

rect varieties. Addition of an occupational therapy aide, a director of education, and a psychiatric social worker to the professional staff provided an opportunity for broadening the general program. The quality of individual clinical records improved as a consequence.

Behavior problems arising in the patient population were handled from the viewpoint of psychiatry with resultant decrease in the incidence and gravity of such problems.

Follow-up studies of 596 former patients 6 or more months after discharge indicated that 48 percent were making a community adjustment without drugs, 16 percent had been unable to do this and had relapsed to the use of drugs, 6 percent had died, and 30 percent could not be located.

A number of lectures were prepared by heads of the various departments and delivered to all personnel on duty at the hospital with the idea that the total program would benefit if the rank and file of employees understood the viewpoints of administrative heads. The results were very gratifying.

The external appearance of the physical plant has been remarkably improved by landscaping and by the addition of appropriate gatehouses at the two entrances to the hospital grounds.

Farm activities produced a supply of milk adequate to permit serving milk at all meals, a particularly appropriate treatment feature for the hospitalized addict who is very frequently undernourished. The production of beef, pork, poultry, the manufacture of garments, together with all activities of maintaining and operating the physical plant, provided an abundance of wholesome occupational therapy for ambulant patients.

A statistical summary of the movement of patients during the year follows:

Statistical summary of patient movement at the United States Public Health Service hospitals, Lexington, Ky., and Fort Worth, Tex., for the fiscal year 1941

	Lexington	Fort Worth
Population June 30, 1940.....	856	711
ADMITTED DURING FISCAL YEAR 1941		
Prisoners:		
Received direct from United States district courts.....	126	92
Received by transfer from Federal prisons.....	373	251
Parole violators returned.....	7	5
Conditional release violators returned.....	57	55
Returned from escape.....	0	7
Returned from writ.....	8	14
Held for United States marshal awaiting trial.....	8	0
Status changed, probationer to prisoner.....	1	0
	580	424
Probationers:		
Received direct from United States courts.....	88	14
Returned from writ, leave, etc.....	13	0
Status changed, prisoner to probationer.....	5	0
Returned for further treatment.....	8	0
Admitted for observation period.....	1	0
	115	14
Voluntary patients.....	331	317
Ex-prisoner patients.....	0	2
	115	14
Total admissions.....	1,026	757
Grand total.....	1,882	1,468

Statistical summary of patient movement at the United States Public Health Service hospitals, Lexington, Ky., and Fort Worth, Tex., for the fiscal year 1941—Continued

	Lexington	Fort Worth
DISCHARGED DURING FISCAL YEAR 1941		
Prisoners, cured:		
On parole, prognosis good.....	23	11
On parole, prognosis guarded.....	2	7
On conditional release, prognosis good.....	0	34
On conditional release, prognosis guarded.....	407	247
On conditional release, prognosis poor.....	43	87
Short term expiration (old law), prognosis poor.....	1	0
Maximum expiration, prognosis poor.....	64	0
Sentence reduced to expire forthwith, prognosis guarded.....	5	0
Prisoners, improved:		
Full term expiration, prognosis poor.....	0	52
Transferred to Federal penal institutions.....	7	35
To United States marshal for trial.....	5	2
On writ of habeas corpus, leave, etc.....	11	17
Escape.....	0	6
Status changed to probationer.....	5	0
Charges dismissed, prisoner awaiting trial.....	1	0
Death.....	12	8
	586	506
Probationers:		
Cured, prognosis good.....	9	9
Cured, prognosis guarded.....	112	17
Cured, prognosis poor.....	12	1
Observation study completed, prognosis good.....	1	0
No longer addict within meaning of the law.....	1	0
Status changed, probationer to prisoner, improved.....	1	0
On writ of habeas corpus, leave, etc., improved.....	13	0
Death.....	3	0
	152	27
Voluntaries, cured:		
Prognosis good.....	5	19
Prognosis guarded.....	38	15
Prognosis poor.....	13	0
Voluntaries, maximum benefit:		
Prognosis guarded.....	0	8
Prognosis poor.....	0	2
Other voluntaries:		
Against medical advice, prognosis poor.....	243	168
Detriment to station.....	0	2
Observation study completed, prognosis good.....	5	0
Not entitled to further treatment, improved.....	2	0
Not a proper charge of the Government.....	0	5
Alien, not entitled to treatment, improved.....	1	0
Fugitive, released to peace officer.....	0	1
On leave of absence, improved.....	37	13
Failure to return from leave, improved.....	5	0
Failure to return from leave, prognosis poor.....	0	79
Eloped, prognosis poor.....	1	0
Death.....	1	2
	351	314
Ex-prisoner patients:		
Against medical advice, improved.....	0	2
	0	2
Total discharges.....	1,089	849
Population June 30, 1941.....	793	619
Average daily population for the fiscal year.....	847	715

MEDICAL AND PSYCHIATRIC SERVICES IN FEDERAL PENAL AND CORRECTIONAL INSTITUTIONS

In accordance with the act of May 15, 1930, and for the eleventh consecutive year, the Public Health Service furnished and supervised the medical, technical, and psychiatric services in Federal penal and correctional institutions under the jurisdiction of the Bureau of Prisons. During the past 4 years, this work has been under the im-

mediate supervision of a commissioned officer detailed to the Bureau of Prisons as medical director.

The duties involved in this activity included, in addition to those directly connected with the medical, surgical, dental, and psychiatric work, the medical examination of all applicants for positions at institutions of the Bureau of Prisons; the reexamination of and advice to employees at annual or more frequent intervals; periodic sanitary inspections of the hospital, cell blocks, and other parts of the institutions; the examination, at least twice daily, of prisoners in punishment isolation; post-mortem examinations of deceased prisoners when necessary; furnishing information to officials regarding the prisoners' condition when eligible for parole, conditional release, or release; research into mental and physical phases of the cause and prevention of conduct disorder and delinquency, and other phases of medical science; the provision of vocational training opportunities in the dental laboratory for dental mechanics, in the hospital for hospital orderlies and practical nurses, in the hospital office for general office work, etc.; cooperation in maintaining satisfactory hygiene and sanitation; advice regarding industrial health and safety in the institutions' shops and factories; and cooperation in other problems related to discipline, recreation, dietetics, and general institution morale.

The Service assumed responsibility for furnishing the medical services at the following institutions which were completed and opened during the year: The Correctional Institution, Danbury, Conn., July 12, 1940; the Correctional Institution, Ashland, Ky., August 25, 1940; the United States Penitentiary, Terre Haute, Ind., October 4, 1940; and the Federal Reformatory for Women, Seagoville, Tex., October 11, 1940. The Penitentiary at Fort Leavenworth, Kan., under the jurisdiction of the Bureau of Prisons since 1930, and used largely for narcotic cases, was returned to the United States Army on November 15, 1940, at which time the medical unit there was discontinued. At the close of the fiscal year, the Service was operating a total of 28 independent units providing complete medical service for 29 institutions, classified as follows:

<i>Institution</i>	<i>Chief medical officer</i>
Penitentiaries (6) :	
Alcatraz, Calif.-----	Surg. (R.) R. M. Ritchey.
Atlanta, Ga.-----	Acting Asst. Surg. George Hess.
Leavenworth, Kans-----	Passed Asst. Surg. J. W. Cronin.
Lewisburg, Pa.-----	Passed Asst. Surg. E. C. Rinck.
McNeil Island, Wash-----	Surg. (R.) R. O. Settle.
Terre Haute, Ind.-----	Surg. J. B. Ryan.
Reformatories (6) :	
Alderson, W. Va. (women)-----	Acting Asst. Surg. T. B. Owen.
Seagoville (Dallas), Tex. (women)-----	Acting Asst. Surg. J. C. Shafer.
Chillicothe, Ohio-----	Med. Dir. D. J. Prather.
El Reno, Okla.-----	Passed Asst. Surg. C. S. Sample, Jr.
Petersburg, Va.-----	Acting Asst. Surg. C. I. Pirkle.
Washington, D. C. (National Training School for Boys).-----	Asst. Surg. Haskell Rosenblum.
Correctional institutions (9) :	
Ashland, Ky.-----	Passed Asst. Surg. E. E. Findlay.
Danbury, Conn.-----	Asst. Surg. J. C. Sturgell.
Englewood (Denver), Colo.-----	Acting Asst. Surg. H. M. Janney.
La Tuna, Tex.-----	Acting Asst. Surg. T. H. Smith.
Milan, Mich.-----	Acting Asst. Surg. A. H. Smith.
Sandstone, Minn.-----	Passed Asst. Surg. (R.) M. A. Ruona.
Tallahassee, Fla.-----	Asst. Surg. G. K. Massengill.
Terminal Island (Los Angeles), Calif.-----	Acting Asst. Surg. H. R. Lipton.
Texarkana, Tex.-----	Asst. Surg. H. E. Wilson.
Detention headquarters (2) :	
New York, N. Y.-----	Asst. Surg. (R.) M. S. Tramontana.
New Orleans, La.-----	Acting Asst. Surg. B. L. Newell.

<i>Institution</i>	<i>Chief medical officer</i>
Prison camps (5): ¹	
Dupont, Wash.-----	Served from McNeil Island.
Kooskia, Idaho-----	Acting Asst. Surg. J. M. Verberkmoes.
Milit Point, W. Va-----	Acting Asst. Surg. K. J. Hamrick.
Montgomery, Ala-----	Acting Asst. Surg. D. N. Rappoport.
Tucson, Ariz-----	Acting Asst. Surg. H. E. Thompson.
Hospital (1):	
Medical Center, Springfield, Mo-----	Sr. Surg. M. R. King.

¹ Springfield, Mo., camp is an integral part of the Medical Center.

During the past several years a systematic effort has been made to improve the caliber of the medical personnel. As a result of careful study, it was determined some time ago that the personnel nucleus of a prison medical unit should consist of a full-time resident staff with four basic functions: First, general medicine and surgery; second, psychiatry; third, dentistry; and fourth, technician-nursing; and a consultant staff of specialists in surgery, eye, ear, nose, and throat, X-ray, and urology. Measures planned and directed toward the accomplishment of this objective included providing special training opportunities for familiarizing physicians with some of the intricacies peculiar to prison practice before they were attached to their permanent stations, and recruiting well-trained technicians from chief pharmacists' mates in the Fleet Reserve of the Navy or from retired master technical sergeants of the Army. A gradual improvement in personnel standards during the past few years was gratifyingly reflected in increased efficiency of the medical service. The national defense emergency, however, unavoidably set the plan back, especially in its research aspects, in spite of every effort to keep the basic staff at its functional level in each institution. Many carefully selected technicians, as well as many experienced prison physicians, were recalled to active military-naval duty. They could not be satisfactorily replaced on short notice, especially since the positions involved were temporary in nature. Some vacancies for psychiatrists and medical technical assistants remained unfilled during the entire year. Some vacancies for medical technical assistants created during the year by the recall of fleet reservists to the Navy were filled by temporary personnel, others remained unfilled. At the close of the year, both medical technical assistant and guard attendant registers were completely exhausted, with little or no prospect that candidates for examination for these positions could be found.

Many refinements were added to the practical everyday administration of the medical program during the fiscal year. Most of these refinements were suggested by experience and the gradual unfolding of a long range plan. For instance, contacts of the medical staff with custodial personnel in classrooms and elsewhere about the institution stimulated a growing interest on the part of custodial officers in reporting developing behavior problems and other situations observed by them in inmates immediately under their charge, thus permitting in many instances medical examination and psychotherapy or other treatment before actual outbreaks occurred. There was a widespread and growing realization that many of the troublesome disciplinary problems, as well as many of the inmates who call repeatedly at sick line, were really neither maliciously bad nor physically ill, but were trying to escape from, or solve, emotional conflicts. This realization is another indication that psychiatry offers the greatest opportunity for discovering the causes and cures of conduct

disorder, which is commonly agreed to be the major purpose behind the augmented medical effort characteristic of modern penology. Another instance was found in the reduction at several institutions of out-patient surgical activities, which could be traced directly to educational campaigns and safety programs, which made inmates more conscious of the hazards associated with the neglect of minor injuries and the value of prompt and proper treatment of them. Another signal reduction in out-patient activities resulted from the successful and widespread use of sulfanilamide and allied preparations.

Research played a significant part in the year's activities. Conduct disorder in general, and delinquency in particular, is caused by a tremendously intricate set of circumstances, and as yet unraveled design, the scientific investigation of which is in its infancy. The Federal Prison Bureau's program, its sanitary, well-lighted and ventilated institutions, its vocational shops, its classrooms, its dairies, farms, adequate diets, abolishment of corporal punishment, intelligent ideals, are the practical parts of a coordinate research project, which hopes for success through such things as the replacement of bad work habits by good ones and the exchange of poor patterns for better ones. Among the special studies carried on during the year were the studies of psychopathy in the special "C. P. I." units at Chillicothe and Springfield. Similar units were being developed at El Reno, Atlanta, and the National Training School for Boys. The problem of the psychopath was being approached at Lewisburg by two investigations, one based on photographic data and the other on differences of electric conductivity under varying circumstances. Studies of group psychotherapy, a most promising research project, were continued at Alderson, Chillicothe, El Reno, Lewisburg, McNeil Island, Springfield, and Terminal Island. The Public Health Service group classification psychometric test, which has been in the process of development for the past 2 years, was perfected sufficiently to permit its adoption on April 1, 1940, with tentative norms at Atlanta, Chillicothe, El Reno, Leavenworth, Lewisburg, National Training School for Boys, Springfield, and Terre Haute. Final norms were ready for release as the fiscal year closed. It is anticipated that a more widespread use of the test will be made during the coming fiscal year. At the request of the subcommittee of the National Research Council under the chairmanship of Dr. Carney Landis, research psychologist at the New York Psychiatric Institute, experimental validation of test items for a personality screening inventory for potential military use was undertaken at Atlanta, Chillicothe, El Reno, Leavenworth, Lewisburg, National Training School for Boys, Springfield, and Terre Haute. Approximately 1,500 inmates were examined with the inventory, and tentative norms for four aspects of personality are gradually being prepared. In addition to whatever value it may have for the military establishment, it is anticipated that this inventory will be applicable to and available for use in Federal penal and correctional institutions. A special study was under way at Atlanta on the relationship of head injuries to maladjustment, migraine, the epilepsies, and similar syndromes, as indicated by the Rorschach and other projective techniques. Studies of correlations between anatomical age, psychological age, and chron-

ological age were begun at the National Training School for Boys. Special diagnostic, therapeutic, and investigative studies of hookworm and malaria were carried on at institutions where these diseases are endemic: One institution (Tallahassee) reported that 23 percent of the total inmates admitted during the fiscal year were infested with hookworm. A cooperative study on the effect of ultraviolet radiation for the control of air contamination and air-borne infections was initiated by the National Institute of Health at the National Training School for Boys.

Among the outstanding accomplishments of the fiscal year was the development, opening, and successful operation of the Central Serologic and Blood Chemistry Laboratory at the Medical Center for Federal Prisoners, Springfield, Mo. At the same institution, there was opened a complete shop for the fabrication of artificial limbs and other orthopedic and prosthetic appliances for Federal prisoners. Both of these projects are of sufficient capacity to serve the entire penal system as well as other Government agencies, should occasion arise.

Numerous lectures and addresses were delivered by staff members to medical societies, luncheon groups, other civic organizations, universities, nursing schools in civilian hospitals, and other institutions of learning. A number of articles relating to the work of the prison medical service were prepared and approved for publication and the following were published during the year: Prison Library Book Prescription, by C. Morrison; Peripheral Vascular Disease, a Diagnostic Problem, by Joseph Zausner; Sanitation in Prisons, by M. R. King; The Place of the Polygraph and the Electroencephalograph in the Study and Treatment of Psychopathy, by R. M. Lindner; Situs Inversus Viscerum: Report of a Case, by Jacob Zellermyer; Acute Yellow Atrophy in Early Syphilis, by Jacob Zellermyer; Medical Center for Federal Prisoners, Springfield, Mo., by M. R. King.

An indication of the scope and steady growth of the medical service is given in the following tables and accompanying graphs.

UNITED STATES PUBLIC HEALTH SERVICE

WORK IN FEDERAL PENAL AND CORRECTIONAL INSTITUTIONS BY FISCAL YEARS ENDING JUNE 30, 1933 TO 1941

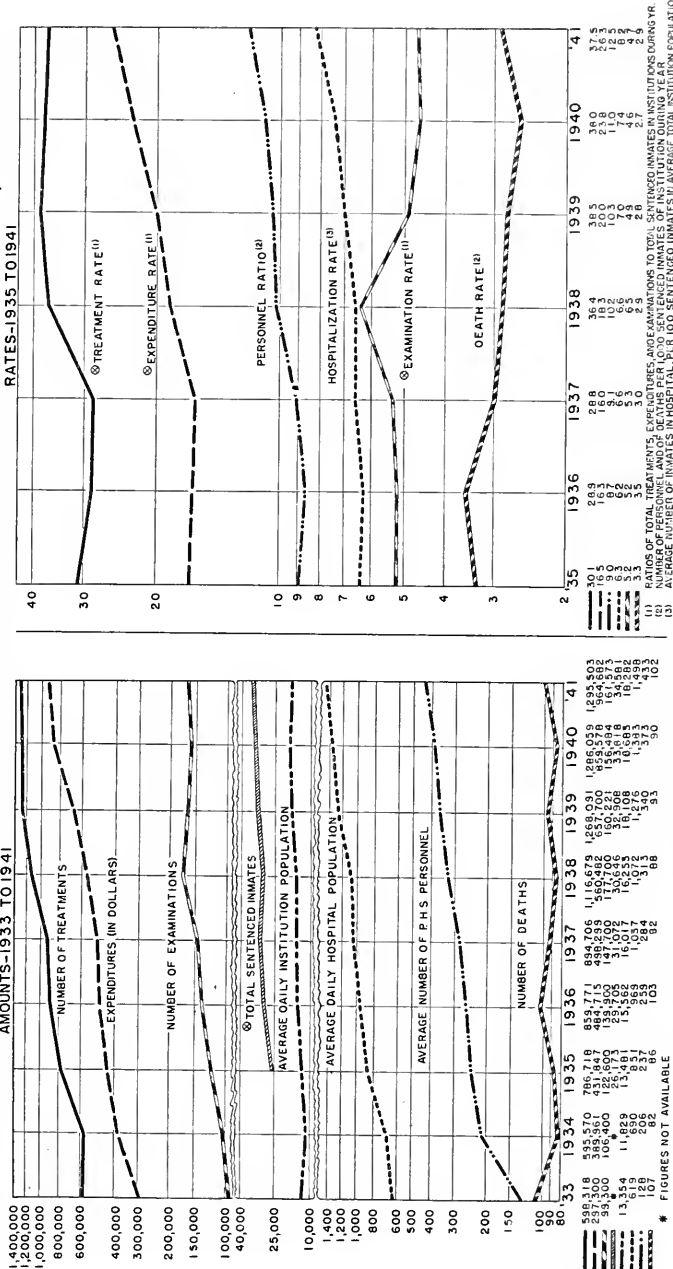


TABLE 1.—United States Public Health Service: Statistics of out-patient medical services in Federal penal and correctional institutions, fiscal year 1941

	July	August	September	October	November	December	January	February	March	April	May	June
(1) Individual inmates who reported to sick line during the month	14,465	14,189	14,034	14,921	15,391	16,099	14,548	13,474	14,507	14,744	15,543	14,838
(2) Number of times individual inmates (listed under (1)) reported to sick line during the month	60,858	58,300	53,670	59,921	58,232	65,950	67,794	62,657	66,819	63,942	63,996	64,081
(3) Number of treatments given, in all out-patient clinics, to inmates reporting to sick line during month ¹	105,502	105,106	95,409	106,916	108,117	119,523	120,112	102,229	112,826	108,829	108,302	102,632
(4) Percentage of total inmates handled who reported to sick line during month	72.7	75.2	76.3	79.6	78.8	81.7	75.2	69.8	74.4	75.4	78.1	73.9
(5) Sentenced population at beginning of each month	18,998	18,314	17,666	17,076	17,527	18,268	18,317	18,150	18,245	18,032	18,178	18,585
(6) Court commitments under sentence during each month	908	554	788	1,677	2,006	1,444	1,040	1,164	1,241	1,324	1,733	1,504
Total	19,906	18,868	18,394	18,753	19,533	19,712	19,357	19,314	19,486	19,556	19,911	20,089

¹ The above figures do not include treatments given "in-patients" treated in "out-patient" departments.

TABLE 2.—United States Public Health Service personnel, treatments, examinations, hospitalization, and deaths compared with average inmate population, for each Federal institution, fiscal year ended June 30, 1911

(Based upon reports furnished the United States Public Health Service by medical departments of the Federal penal and correctional institutions)

Item	All institutions	Penitentiaries for—				Reformatories for—				Female offenders		
		Habitual tractable male offenders		Narcotic offenders, Fort Leavenworth, Kans.	Older improvable offenders		Agricultural-type improvable offenders, Petersburg, Va.	Younger improvable male offenders				Juvenile delinquents, National Training School for Boys (D. C.)
		Atlanta, Ga.	Leavenworth, Kans.		Lewisburg, Pa.	McNeill Island, Wash. ^a		Terre Haute, Ind.	Chillicothe, Ohio	El Reno, Okla.	Denver, Colo.		Alderson, W. Va.	Dallas, Tex.
Personnel (June 30, 1911):												
Medical officers—full time.....	80	2	6	(b)	5	4	3	6	2	3	2	2
Medical officers—part time.....	92	1	4	(b)	10	4	—	6	2	4	3	5
Dental officers—full time.....	28	1	2	(b)	2	1	1	1	2	1	1	1
Dental officers—part time.....	5			(b)								
All other Public Health Service.....	261	5	6	(b)	7	3	4	9	6	6	6	6
Total Public Health Service.....	466	9	18	(b)	24	12	8	22	15	15	12	14
Inmate personnel (average).....	638	4	86	(b)	59	40	15	30	34	34	6	21
Hospital bed capacity (normal).....	2,313	20	148	(b)	84	85	91	41	73	77	25	30
Average daily institution population.....	18,282	288	2,859	e 421	1,448	1,087	e 444	747	1,238	204	391	e 123
Average daily hospital population.....	1,497.9	15.4	97.1	25.2	38.5	61.3	11.3	30.5	41.7	34.1	7.5	13.1
Surgical operations.....	10,704	8	1,540	75	1,486	456	128	272	646	468	256	118
Hospital relief—days.....	546,728	5,619	35,434	3,898	14,059	22,358	2,400	11,139	15,209	12,434	4,798	17,683
Deaths.....	102	1	7	2	2	7	—	5	2	2	4	—
Out-patient departments:												
Treatments of inmates:												
Medical.....	649,285	16,016	54,710	1,808	31,308	60,674	17,212	35,762	84,103	19,246	9,609	23,934
Surgical.....	89,627	1,727	23,184	1,840	9,401	5,951	1,042	1,808	4,797	5,298	1,567	1,171
Urological and venereal disease.....	164,424	1,828	22,091	665	15,278	4,662	1,465	12,293	6,815	7,374	368	19,449
Eye, ear, nose, and throat.....	73,108	2,273	3,989	738	8,104	2,745	1,404	4,011	3,536	1,644	991	2,808
Dental.....	155,958	2,215	12,614	882	9,054	8,885	4,222	8,938	11,991	15,614	5,218	4,205
Psychiatric.....	42,155	1,132	11,434	1,207	6,621	3,346	92	1,736	1,736	784	60	605
Psychological.....	12,971	188	285	136	3,886	84	84	3,502	2,737	18	233	—
Physiotherapy.....	107,531	5,433	5,576	1,132	6,338	3,147	2,013	2,688	6,759	4,938	223	329
X-ray and radium.....	444	29	80	80	3,147	79	—	45	2,891	2,891	223	329
Total.....	1,295,503	30,842	133,912	5,950	84,050	89,489	27,624	65,545	123,239	57,545	18,209	52,081

Footnotes at end of table.

TABLE 2.—United States Public Health Service personnel, treatments, examinations, hospitalization, and deaths compared with average inmate population, for each Federal institution, fiscal year ended June 30, 1941—Continued

Item	All institutions	Penitentiaries for—			Reformatories for—				
		Intra-cetable male offenders—Alcatraz, Calif.	Habitual tractable male offenders	Nar-cotic offenders, Fort Leavenworth, Kans.	Older improvable offenders	Agricultural-type improvable offenders	Younger improvable male offenders	Juvenile delinquents, National Training School for Boys (D. C.)	Female offenders
Out-patient departments.—Con.]									
Examinations of inmates:									
Medical.....	69,315	276	5,625	342	1,537	3,820	2,616	693	220
Urological and venereal disease.....	69,192	319	6,618	350	19,213	2,412	3,685	582	482
Eye, ear, nose, and throat.....	20,460	95	3,315	146	2,778	497	1,850	183	61
Dental.....	30,981	564	2,663	149	1,374	3,782	1,663	507	266
Psychiatric.....	34,533	207	3,119	50	2,666	639	1,825	634	1
Psychological.....	26,744	21	4,869	171	587	1	9,818	457	1
Total.....	251,225	1,482	26,239	1,208	28,355	11,151	21,457	3,103	1,030
Examinations (medical) of civilians.....	7,081	150	521	7	554	180	427	225	108
X-ray—number of films developed.....	15,499	307	1,039	236	1,442	527	761	258	65
X-ray—number of fluoroscopic examinations.....	2,804	.....	138	444	181	137	11	19	3
Laboratory service—number of tests, etc.....	170,639	425	8,651	1,154	14,810	5,868	6,521	1,245	673
Pharmacy service—prescriptions dispensed.....	380,521	12,137	29,915	3,354	32,854	29,405	2,071	4,354	1,360

Item	Correctional institutions for short-term male offenders								Prison camps for road-construction-type improvable male offenders				Detention headquarters (chiefly for men awaiting trial)		Medical center (men) spring-field, Mo.
	Ashland, Ky.	Danbury, Conn.	El Paso, Tex.	Milan, Mich.	Sandstone, Minn.	San Pedro, Calif.	Tallahassee, Fla.	Texas, Tex.	Montgomery, Ala.	Tucson, Ariz.	New Orleans, La.	New York, N. Y.			
Personnel (June 30, 1941):															
Medical officers—full time	2	2	2	2	2	2	2	1			1	3			15
Medical officers—part time	4	2	5	2	1	6	2	5		2	2	1			8
Dental officers—full time	1	1		1	1	1	1	1			1				3
Dental officers—part time			1							1					
All other Public Health Service	3	3	3	3	3	3	3	3		1	1				
Total Public Health Service	10	8	11	8	7	12	8	10			3	3			156
Inmate personnel (average)	14	12	13	12	18	22	5	13		4	7	7			182
Hospital bed capacity (normal)	28	33	26	32	28	41	20	26		6	10	10			38
Average daily institution population	330	290	516	492	356	433	430	153		34	340	355			950
Average daily hospital population	18.1	14.7	26.4	16.3	18.2	33.7	13.3	5.8		13.6	14.4	10.2			78.1
Surgical operations	140	48	288	400	359	362	169	73		7	183	388			1,310
Hospital relief-days	4,382	4,904	9,645	6,171	6,651	12,287	4,870	1,592		1,325	5,251	3,733			287,644
Deaths	1	1	3	2	1	5		4		1	1				38
Out-patient departments:															
Treatments of inmates:															
Medical	9,849	18,068	19,905	31,840	10,973	33,881	36,034	6,174		3,549	16,667	8,522			2,460
Surgical	3	1,624	3,839	3,343	1,086	3,808	4,727	1,135		1,102	2,453	278			30
Urological and venereal disease															
Eye, ear, nose, and throat	2,143	1,787	8,103	2,301	4,456	4,144	7,922	1,939		2,855	8,311	1,765			5,929
Dental	627	2,576	6,573	2,810	942	5,317	1,741	929		869	4,061	967			1,214
Psychiatric	5,447	1,916	1,520	6,958	4,104	5,067	5,889	1,551		604	6,474	488			10,668
Psychological			255	2,179	792	2,055					10				15,326
Physiotherapy															
X-ray and radium	1,942	4,952	2,133	3,107	1,650	9,147	5,296	1,589		771	2,112	1,720			25,174
Total	20,011	30,923	42,328	52,544	24,042	63,419	61,009	13,317		7,153	40,088	13,740			60,938

Footnotes at end of table.

TABLE 2.—United States Public Health Service personnel, treatments, examinations, hospitalization, and deaths compared with average inmate population, for each Federal institution, fiscal year ended June 30, 1941—Continued

Item	Correctional institutions for short-term male offenders								Prison camps for road-construction-type improvable male offenders				Detention headquarters (chiefly for men awaiting trial)		Medical center (men) Springfield, Mo.
	Ashland, Ky.	Danbury, Conn.	El Paso, Tex.	Milan, Mich.	Sandstone, Minn.	San Pedro, Calif.	Tallahassee, Fla.	Texarkana, Tex.	Kooskia, Idaho	Mill Point, W. Va.	Montgomery, Ala.	Tucson, Ariz.	New Orleans, La.	New York, N. Y.	
Out-patient departments—Con.															
Examinations of inmates:															
Medical	1,407	2,047	2,399	2,235	674	4,346	2,466	681	428	825	1,622	370	2,482	3,907	5,474
Urological and venereal disease	1,282	1,437	4,178	1,936	1,280	1,544	2,138	503	190	931	1,215	373	2,459	966	2,239
Eyes, ear, nose, and throat	80	101	425	1,593	180	245	158	34	302	132	683	25	549	331	1,350
Dental	877	872	285	477	1,031	901	1,026	552	155	239	683	42	1,251	282	2,069
Psychiatric		826	60	663	654	4,163		594					25	97	7,920
Psychological		727			686	173							1	97	412
Total	3,646	6,010	7,347	5,904	4,505	11,372	5,788	2,364	1,075	2,127	3,520	810	6,771	5,680	19,464
Examinations (medical) of civilians	95	226	538	111	114	177	204	112	27	23	60	38	57	453	974
X-ray—number of films developed	131	205	498	476	427	271	64	270	15	3	21	43	212	703	3,700
X-ray—number of fluoroscopic examinations	113			128	33	49	12	44	14	18	4	1	3	19	1,228
Laboratory service—number of tests, etc.	798	2,393	9,732	3,696	4,639	5,048	1,919	2,268	257	443	1,770	626	4,118	3,707	65,309
Pharmacy service—prescriptions dispensed	1,572	10,567	10,011	20,459	11,304	3,715	10,315	8,352	4,517	523	5,697	8	7,890	338	15,041

^a Figures for the McNeil Island Penitentiary also cover Prison Camp, DuPont, Wash.

^b On Nov. 29, 1940, the Fort Leavenworth Penitentiary was turned back to the War Department after the remaining staff and inmates were transferred to other Bureau of Prisons institutions.

^c Based on the number of days actually in operation.

STUDIES AND INVESTIGATIONS OF THE CAUSES, PREVALENCE, AND MEANS
FOR THE PREVENTION AND TREATMENT OF MENTAL DISEASE

The psychiatric diagnostic service for Federal courts was continued during the year at the 10 units previously established. These units operate in connection with the United States district courts at Atlanta, Baltimore, Boston, Denver, Detroit, Kansas City, Mo., Minneapolis, New York City, Philadelphia, and Pittsburgh. The number of patients examined totaled 124, and of these 2 were hospitalized for further observation. Numerous requests for the expansion of this service were received from persons interested but because of lack of funds it was not possible to comply with them.

The Section on Mental Health Methods continued the work of surveying public mental hospitals. During the year surveys were made of 14 hospitals for mental disease in 9 States, 5 schools for mental defectives in 4 States, and 1 institution for convulsive disorders. The States involved were Arkansas, Colorado, Idaho, Illinois, Louisiana, New York, Oregon, South Dakota, and Utah. Of the 14 hospitals for mental disease mentioned above, 4 were resurveyed. Surveys were also made of the psychiatric services in 11 general hospitals in 5 States: Louisiana, Missouri, New York, Oregon, and Virginia. Besides the institutions studied, 24 others were visited in order to note changes and improvements in practices, because advice was requested on additional points, or for other special reasons.

Miscellaneous activities of an informational and educational nature also have been carried on relating to administration, personnel, equipment, the planning of buildings for mental hospitals and schools, and treatment of and legal relations to patients. Exhibits were provided for the annual meetings of the American Psychiatric Association and the American Association on Mental Deficiency.

The field studies in mental hygiene carried on in Lexington and Fayette County, Ky., were discontinued at Lexington and transferred to the Section on Mental Health Methods in the Washington office where the data gathered are now being prepared for publication.

Passed Assistant Surgeon Victor H. Vogel, a specially trained officer, has been on duty with the Section on Mental Health Methods during the year as mental hygiene consultant to the States. His activities have consisted chiefly of promoting the acceptance of emotional and mental illnesses as a problem for organized public health authorities and rendering advisory services on the organization of mental hygiene-public health programs in States and communities that have requested such assistance.

The Public Health Service, aware of the magnitude of the problem of nervous and mental diseases and the relative paucity of research in these diseases as compared with that in other medical fields, has recommended from time to time the establishment, within its jurisdiction, of an institute for the study of mental and nervous diseases and epilepsy. This suggested institute has received favorable attention from psychiatrists and others throughout the country, and has been endorsed by the American Psychiatric Association, the American Neurological Association, the Section on Nervous and Mental Diseases of the American Medical Association, and the National Committee for Mental Hygiene. At the request of the Scientific Ad-

ministration Committee of the National Committee for Mental Hygiene, an advisory council was appointed for the purpose of exploring the methods of promoting research in nervous and mental diseases and to advise what, if anything, should be done in this field. The council, composed of seven outstanding men in the field of mental and nervous diseases, met on December 16, 1940, and after considering all angles of the problem strongly recommended that the Service establish an institute for the study of nervous and mental diseases, in or near the District of Columbia, as a separate Division of the Public Health Service which would work in close cooperation with St. Elizabeths Hospital and the National Institute of Health. It also recommended that the primary objectives of the institute in connection with mental and nervous diseases should be (1) prevention, (2) the improvement of diagnosis in the subclinical stages, and (3) the development of better methods of treatment. The recommendations of the Committee have been given serious consideration but, owing to the priority of defense activities, no further action has been taken on the matter.

In connection with the studies relating to mental diseases, a number of talks were given before interested groups and a number of articles were published in Service as well as outside publications, as follows: Regional Differences in the Hospitalization and Care of Patients with Mental Diseases, by Joseph Zubin and Grace C. Scholz; Eugenic Sterilization in the United States, by James E. Hughes; A Mental Hygiene Program for the State Health Department, by Victor H. Vogel; The Minnesota "Sexual Irresponsibles" Law, by James E. Hughes; A Further Study of the Rorschach Test Applied to Delinquents, by M. J. Pescor; The Place of the Polygraph and the Electroencephalograph in the Study and Treatment of Psychopathy, by Robert M. Lindner; Alcoholism and Public Health, by Lawrence Kolb; Looking Ahead in Mental Hygiene, by Victor H. Vogel. Additional articles have been approved for publication.

RECOMMENDATIONS

It is recommended that the Public Health Service Hospitals at Fort Worth, Tex., and Lexington, Ky., be utilized for the treatment of voluntary patients addicted to alcohol. Alcoholism is an important public health problem. No State has made adequate provision for the treatment of chronic alcoholics at public expense. Thousands of these patients go from bad to worse until rehabilitation is impossible.

It is further recommended that, when the present national emergency will permit, serious consideration be given to the establishment in the Public Health Service of an institute for research in mental and nervous diseases and epilepsy. This recommendation has been made for the past 3 years.

DIVISION OF PERSONNEL AND ACCOUNTS

Assistant Surgeon General PAUL M. STEWART in charge

The Personnel and Accounts Division supervises all operations of the Service relating to personnel, finances, and the maintenance of property records. The organization of the Division has remained unchanged during the year. Through a personnel section, a finance section, and a property record section, all matters relating to appointments, separations, and other changes in status of personnel, estimates of appropriations, allotments, and encumbrances, records of expenditures, including administrative audit, and all records of nonexpendable property are administered under the supervision of the Assistant Surgeon General in charge of the Division.

PERSONNEL

COMMISSIONED OFFICERS

The following table shows the commissioned officers in the Regular Corps of the Public Health Service on July 1, 1940, and July 1, 1941:

	July 1, 1940		July 1, 1941	
	Active	Waiting orders	Active	Waiting orders
Surgeon General.....	1	1	1	1
Assistant Surgeon General.....	8		8	
Medical director.....	34	33	43	34
Sanitary engineer director.....		1		1
Pharmacologist director.....	1		1	
Senior surgeon.....	45	8	42	6
Senior dental surgeon.....	6		10	
Senior sanitary engineer.....	11		14	1
Surgeon.....	65	13	58	14
Dental surgeon.....	12		10	
Sanitary engineer.....	8		4	
Passed assistant surgeon.....	141	6	168	6
Passed assistant dental surgeon.....	29	2	28	2
Passed assistant sanitary engineer.....	5		7	
Passed assistant pharmacist.....	4	4	4	2
Assistant surgeon.....	110		117	
Assistant dental surgeon.....	2	1	1	1
Assistant sanitary engineer.....			2	
Assistant pharmacist.....		1		
Total.....	482	70	518	68

CHANGES DURING THE YEAR

	Promoted to next grade	New appointments	Retired	Deaths	Resignations	Separations
Medical director.....			4	3		
Senior surgeon.....	13			2		
Senior sanitary engineer.....			1	1		
Surgeon.....	10					
Dental surgeon.....	4					
Sanitary engineer.....	4					
Passed assistant surgeon.....	5					
Passed assistant dental surgeon.....	2					
Passed assistant sanitary engineer.....		2				
Passed assistant pharmacist.....				2		
Assistant surgeon.....	32	47			6	2
Assistant dental surgeon.....	1					
Assistant sanitary engineer.....		2				
Assistant pharmacist.....				1		
Total.....	71	51	6	9	6	2

NOTE.—One assistant surgeon general reverted to grade of medical director.

SPECIAL DETAILS TO OTHER ACTIVITIES

	Medical director	Senior surgeon	Surgeon	Passed assistant surgeon
Bureau of Indian Affairs.....	2		3	2
Pan American Sanitary Bureau.....		1	2	1
Farm Security Administration.....		1		
Bureau of Prisons.....		1		
Employees' Compensation Commission.....			2	1
National Youth Administration.....				1
Social Security Board.....		1		
Detailed to U. S. Army.....	4	3	1	
Total.....	6	7	8	5

RESERVE OFFICERS (ACTIVE DUTY)

Grade	July 1, 1940	July 1, 1941
Medical director.....		1
Senior surgeon.....		1
Senior sanitary engineer.....		1
Surgeon.....	8	15
Sanitary engineer.....	1	2
Passed assistant surgeon.....	26	37
Passed assistant dental surgeon.....	5	5
Passed assistant sanitary engineer.....		3
Assistant surgeon.....	68	130
Assistant dental surgeon.....	26	45
Assistant sanitary engineer.....	11	20
Total.....	145	260

ACTING ASSISTANT SURGEONS

	July 1, 1940	July 1, 1941
In marine hospitals.....	95	116
Immigration, relief and maritime, border, insular, and foreign quarantine work.....	439	464
Field investigations of public health.....	6	10
Coast Guard and Lighthouse Services.....	125	162
Employees' Compensation Commission.....	3	3
Penal and correctional institutions.....	61	58
Antivenereal disease activities.....	33	30
Total.....	762	843

CONTRACT DENTAL SURGEONS

Grade	July 1, 1940	July 1, 1941
In marine hospitals.....		3
Second- and third-class relief stations.....	41	39
Penal and correctional institutions.....	4	
Coast Guard.....	6	6
Total.....	57	48

ATTENDING SPECIALISTS

Consultants in marine hospitals.....	339	357
Second- and third-class relief stations.....	44	45
Antivenereal disease activities.....	88	99
Penal and correctional institutions.....	136	196
Consultants in quarantine, immigration, and scientific research activities.....	186	182
Total.....	793	879

INTERNES

Grade	July 1, 1940	July 1, 1941
Medical and dental internes.....	134	119
PHARMACISTS AND ADMINISTRATIVE ASSISTANTS (CIVIL SERVICE)		
Pharmacist.....	18	20
Administrative assistant.....	73	72
Total.....	91	92

EPIDEMIOLOGISTS

During the year the number of assistant collaborating epidemiologists was decreased from 5,042 to 4,974. These employees are health officers or employees of State or local boards of health, who receive only nominal compensation from the Federal Government and who furnish the Service with reports of communicable diseases received by State or local health organizations. The number of collaborating epidemiologists on duty on July 1, 1941, was 51. These appointees are officials of the State boards or departments of health and are on duty in the different States.

NATIONAL INSTITUTE OF HEALTH

The scientific staff of the National Institute of Health comprised 450 members, of whom 93 were commissioned officers and 357 other professional workers. The staff was assisted by 323 technicians and 475 other subordinates, making a total of 1,248.

In addition to the regular corps, 149 persons held appointments as consultants.

PROPERTY RECORDS

The Property Return Section accounted for all property of the Service and 359 property returns were audited during the year. A total of \$4,292.06 was turned in to "Miscellaneous Receipts" from 78 sales of property.

Property surplus to the Public Health Service valued at \$27,507.47 was transferred to other Government departments. Surplus property of other Government departments valued at \$5,119.62 was taken over by the Public Health Service.

Property valued at \$50,288.09 was transferred from Service stations where it was surplus to other stations where it could be used.

ACCOUNTS SECTION

The Accounts Section of the Division of Personnel and Accounts conducts all bookkeeping and accounting in connection with the expenditure of Public Health Service appropriations. This includes also accounts of miscellaneous collections, allotments, records of encumbrances, cost accounting, and the administrative audit. A statement of appropriations, expenditures, and balances, with miscellaneous receipts, is published as an appendix to this report.

PERSONNEL STATEMENT

The accompanying tabular statement shows the personnel of the Service as of July 1, 1941. Of the 16,002 employees shown in the table, 5,125 listed as collaborating epidemiologists and assistant collaborating epidemiologists receive only nominal compensation. They are mainly officers or employees of State and local health organizations who collaborate in the collection of morbidity statistics by furnishing the figures collected by those organizations relating to cases of communicable diseases. The personnel statement also includes all part-time employees, those employed on a per diem basis, and those whose compensation is on a fee basis.

Consolidated quarterly personnel report for quarter ended July 1, 1941

[Prepared from records in the Division of Personnel and Accounts]

U. S. Public Health Service	Regular corps						Reserve corps				Noncommissioned personnel																Totals									
	Surgeon general	Assistant surgeon general	Medical director	Senior surgeon	Surgeon	Passed assistant surgeon	Assistant surgeon	Medical director	Senior surgeon	Surgeon	Passed assistant surgeon	Assistant surgeon	Acting assistant surgeon	Attending specialists and consultants	Contract dental surgeons	Interns	Pharmacist	Administrative assistant	Assistant collaborating epi- demiologists and collab- orating epidemiologists	Druggist	Aide (P. T. and O. T.)	Nurse	Scientific personnel and hospital laboratorians	Pilot	Marine engineer	Sanitary inspector and fumigator	Clerk	Departmental personnel (regular)	Temporary emergency workers	Attendant	All other field employees	Commissioned officers (regular and reserve)	Noncommissioned em- ployees	Sub (or station total)	Grand (or division total)	
Administrative and departmental.	1	8	2	7	5	2	6																													353
Hospital division:																																				6,251
Marine hospitals:																																				
Baltimore, Md.				2	2		6					1	10	4	27	11	2	2	1	2	4	3	78	9							169	34	29	372	401	
Boston, Mass.			1	1	2						1	2	5	4	33	3	1	1	1	1	1	4	44	6						130	46	16	246	312		
Buffalo, N. Y.			1				1					3	5	2	7	1	1	1	1	1	2	7	1							17	11	5	53	58		
Carville, La.																																				
Chicago, Ill.				1	1							5	3	6	22	7	1	1	2	2	2	1	30	3						193	103	1	332	333		
Cleveland, Ohio.							3					4	3	9	16	2	1	1	1	1	2	37	8						76	34	9	200	200			
Detroit, Mich.			1				3					7	5	16	10	2	1	2	2	2	2	36	2						85	29	10	198	208			
Ellis Island, N. Y.			2				2					2	2	5	16	1	1	1	1	1	5	52	3						11	99	31	16	208	224		
Evansville, Ind.							1					1	1	9	16						1	10	3						172	13	9	276	285			
Fort Stanton, N. Mex.					2		2					1	2	3	9	2	1	1	2	2	1	12	1						11	32	63	5	147	152		
Galveston, Tex.				1	2		1					2	2	14	18	2	1	1	1	1	2	2	25	2					8	61	26	9	147	156		
Hudson Street, N. Y.							3					1	2	2	3	1	1	1	1	9	1	8	4						17	14	26	6	112	118		
Key West, Fla.												2	1	1	1														3	19	6	3	39	42		
Louisville, Ky.												2	1	1	1	1	1	1	1			16	2						7	7	41	15	5	107	112	
Memphis, Tenn.				1	1		1					2	1	2	1	1	1	1	1	1	1	18	3						3	3	3	6	125	131		
Mobile, Ala.												1	5	1	1	1	1	2	2	1	1	24	3						55	19	8	123	131			
New Orleans, La.			1	1	4		6					8	5	15	15	14	2	1	1	3	4	58	9						26	156	41	21	335	356		
Norfolk, Va.				1	1							5	3	4	11	2	1	1	2	1	2	39	6						18	111	30	13	240	253		
Pittsburgh, Pa.												2	2	4	11	1	1	1	1	1	1	12	1						6	7	4	66	70			
Portland, Maine.				1	1		2					1	1	1	17	1	1	1	1	1	1	10	2						11	20	20	10	5	61	66	
Kirkwood, Mo.				2	1		1					1	2	3	23	12	3	1	1	1	1	20	2						14	132	44	22	10	132	142	
San Francisco, Calif.			1	1			4					1	1	5	9	2	1	1	1	5	3	60	7						14	133	49	21	313	334		
Savannah, Ga.							1					5	3	5	23	12	3	1	2	2	2	22	2						8	49	8	7	114	121		

Foreign ports	3	1	8	1	15	1	2	8	19	3	3	13	41	51
All other stations	5	1	3	4	219	1	2	8	3	2	15	11	73	20
Domestic Quarantine Division	1	1	1	1	1	1	1	1	8	2	1	22	2	33
Plague suppressive measures	1	1	1	1	1	1	1	1	9	9	31	87	49	190
Rural health cooperation	1	1	8	4	2	5	4	24	1	43	1	9	239	1,218
All other activities	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Scientific research division	1	1	1	1	1	1	1	1	1	1	1	1	1	1
National Institute of Health (Admin.)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Division of Chemistry	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Division of Chemotherapy	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Division of Zoology	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Division of Infectious Diseases	2	5	6	14	5	1	16	1	3	36	27	139	33	222
Division of Public Health	1	1	6	1	2	1	50	1	52	68	47	12	219	231
Methods	2	3	4	2	3	13	2	19	43	25	22	27	111	138
Division of Industrial Hygiene	2	1	2	2	16	6	6	2	1	66	18	68	7	170
National Cancer Institute	1	1	5	1	5	1	5	1	8	2	3	20	8	38
Cooperative projects	1	1	1	1	1	1	1	1	1	1	1	1	1	1
All other activities	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Division of Sanitary Reports and Statistics	1	1	27	5	30	99	1	5,125	33	58	60	10	5,153	5,153
Division of Venereal Diseases	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Division of Mental Hygiene	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acetraz Island, Calif.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Alderson, W. Va.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Atlanta, Ga.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chillicothe, Ohio	1	1	1	1	1	1	1	1	1	1	1	1	1	1
El Reno, Okla.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fort Worth, Tex.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Seaville, Tex.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Leavenworth, Kans.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lexington, Ky.	2	1	6	4	8	1	3	2	11	10	36	141	68	17
Lewisburg, Pa.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
McNeil Island, Steilacoom, Wash.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Milan, Mich.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
New Orleans, La.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Petersburg, Va.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Springfield, Mo.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tucson, Ariz.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
All other activities	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Miscellaneous	6	7	8	5	1	2	6	1	3	3	3	36	3	39
On waiting orders (commissioned officers)	1	35	7	14	10	1	1	1	1	1	1	68	68	68
All other, including Public Health Service districts	6	10	7	8	7	1	4	7	5	8	105	50	188	238
Grand total	2	8	79	86	217	121	1	217	45	195	843	879	48	16,002

CHIEF CLERK'S OFFICE

DANIEL MASTERSON, Chief Clerk and Administrative Officer

Departmental personnel.—On July 1, 1940, the departmental employees at Service headquarters in Washington numbered 258. At the close of business on the preceding day 39 departmental employees had been transferred to the appropriation "Salaries, Office of the Administrator, Federal Security Agency." These transferred employees consisted of the following: 24 on personnel work, 11 on photographic and processing work, 2 on requisition and shipping operations, and 2 on legal duties. All but 8 of these employees remained at Public Health Service headquarters and continued their former work.

During the course of the year a number of emergency employees were granted permanent departmental status under Civil Service laws and regulations, and a large number of new appointments were made because of increasing work, particularly on account of national defense activities. The departmental force was thus substantially increased, so that on July 1, 1941, 336 employees were on duty, with prospects of further unavoidable increases.

During the year there were 118 appointments, 5 retirements, 2 deaths, 31 separations, 29 transfers to other agencies, 68 promotions in grade, 2 administrative promotions, and 12 reallocations of positions. Peak loads and special work necessitated the employment of 14 temporary employees, 3 of whom were on duty at the close of the year.

The average salary decreased in the course of the year from \$1,841.10 to \$1,793.71. Sick leave averaged 8.42 days per employee as compared with 8.17 for the preceding years. Punctuality in reporting for duty was virtually perfect, being less than one case per employee for the year.

Miss Anna A. Burns, grade CAF-2, and Miss Caroline M. Burns, grade CAF-4, were retired for age, and Mr. Owen F. Bever, grade CAF-5, Miss Agnes B. Cummings, grade CAF-4, and Mrs. Katy H. McCall, grade CAF-35 were retired because of physical disability.

Mr. Charles N. McMunn, grade CAF-9, and Mr. James V. Hackney, grade CU-3, died February 26 and May 28, 1941, respectively.

Messrs. John S. Simmons, Felix Liski, and Edward J. Safflower entered the military service under the Selective Training and Service Act.

Mr. Preston H. Shultz was called to active duty with the Army under his reserve commission and Mr. Harvey Strong resigned to enlist in the Army Air Corps.

The participation of the Public Health Service in national defense activities, particularly through appropriations made for emergency health and sanitation work, added greatly to the burden at Service headquarters and made necessary a substantial increase in personnel.

Those employed under the defense appropriations were given a status prescribed by the Civil Service Commission as "probational indefinite," which gave them a permanent status, subject, however, to possible termination at the conclusion of the emergency.

Overtime work was common throughout the year and it was found very difficult to grant the usual vacations allowed by law.

Efficiency ratings.—During the fiscal year 1940, the Administrator of the Federal Security Agency decided that the efficiency rating system in use for departmental personnel should be extended to all full-time employees on duty in the field service. Accordingly, the Efficiency Rating Committee for the Public Health Service was given the duty of supervising this efficiency rating operation for field personnel. The Committee thereupon prepared comprehensive instructions, based upon law and Civil Service regulations, for the guidance of supervisors at field stations and embodied them in General Circular No. 82, of March 20, 1940. As this type of efficiency ratings was new to field supervisors, a number of difficulties and questions were presented for solution, but on the whole the system appeared to operate with gratifying smoothness. The 1941 efficiency ratings have now been virtually completed, and it is observed that the field officers handled this very responsible function with evident good judgment and with relatively few difficulties. Approximately 7,000 employees were rated in April 1941.

In anticipation of complaints on the part of those rated, an appeals procedure was also devised and communicated to the field personnel. Only four employees appealed from their ratings in 1940, and these appeals were handled in accordance with this procedure. The method operated efficiently and the results were apparently satisfactory to all concerned.

Office quarters.—The National Institute of Health released custodial maintenance of the four buildings at Twenty-fifth and E Streets NW., Washington, D. C., to the Buildings Administration of the Federal Works Agency. The three northernmost buildings were released to other Government agencies. The South Building was retained and has provided much needed space for important laboratory operations and for office quarters for employees engaged in Public Health Service defense work as well as office quarters for Public Health Service District No. 2. The space thus occupied facilitated the emergency defense programs, but the crowded condition of the Administration Building at Nineteenth Street and Constitution Avenue remained as a problem.

Supplies and equipment.—For stationery supplies for headquarters and the entire field service, the sum of \$44,000 was expended from the appropriation "Printing and Binding, Federal Security Agency, 1941" and \$25,000 from Public Health Service appropriations. In connection with the procurement of stationery supplies, it was necessary, because of certain limitations imposed by the Procurement Division on stock stationery items, to establish an adequate stationery stock supply in the administrative headquarters for offices in Washington and in the field. This stock is maintained through a perpetual inventory system. There are a number of advantages in stocking and

shipping these supplies. Clerical labor is relieved through the elimination of duplication of work, there is a saving of 10 to 15 days in the time required to make shipment, and shipments of stationery supplies and printed supplies may be consolidated, thereby effecting substantial savings in transportation costs. Shipments of stationery supplies and printed supplies during the fiscal year amounted to 290,737 pounds, as compared to 153,075 pounds for the previous year. For equipment, office supplies, and services for the administrative headquarters, \$15,407 was expended from the Contingent Appropriation, \$25,608 from other Public Health Service appropriations, and approximately \$68,560 was expended from the Emergency Health and Sanitation Activities appropriation (national defense) for equipment both in the administrative headquarters and in the field.

Mail and Records Section.—The following statistics show the number of pieces of incoming and outgoing mail and telegrams, and also the quantity of correspondence classified, recorded, and filed during the fiscal year ended June 30, 1941:

Incoming mail.....	732, 870	
Incoming telegrams.....	8, 932	
Total incoming correspondence.....		741, 802
Outgoing mail.....	312, 555	
Outgoing telegrams.....	6, 867	
Total outgoing correspondence.....		319, 422
Grand total.....		1, 061, 224
Mail classified only.....		154, 758
Mail classified and recorded.....		187, 328
Correspondence filed.....		273, 216

Library.—Approximately 625 bound volumes and 725 pamphlets were added to the library during the fiscal year. The total collection now numbers approximately 17,095 bound volumes and 9,875 pamphlets. Sixty-five of the new books were purchased, the remainder consisting of books received as gifts, bound volumes of periodicals, and documents and reports from State, municipal, and foreign governments.

Three hundred and twenty current serial periodicals were received regularly and routed to persons who wished to review them. Only 34 of this number were paid subscriptions; the others were received gratuitously and by exchange. Forty of the medical journals added during the year were received through the efforts of the Division of Sanitary Reports and Statistics, which obtained them in exchange for Public Health Reports. Approximately 145 bulletins were received from State, municipal, and foreign health and welfare departments. The conditions abroad have had their effect upon the receipt of foreign medical journals, and reports and bulletins from foreign boards of health. Publications from the British Empire are virtually the only ones now received regularly. In this country, however, there has been a great increase in the amount of material published on health, as the subject has become a matter of vital interest in national affairs.

The following table summarizes the activities of the library during the fiscal year:

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
Public Health Service books circulated.....	342	366	394	450	521	418	361	407	462	351	590	580	5,242
Books borrowed from outside libraries and circulated.....	25	61	57	59	59	25	22	30	51	30	46	46	511
Total circulation.....	367	427	451	509	580	443	383	437	513	381	636	626	5,753
Books circulated in field service (included in circulation report, above).....	8	6	14	12	14	5	8	10	18	14	-----	23	132
Catalog cards filed.....	301	147	372	518	388	107	6	282	8	323	187	333	2,992

Printing and binding.—The printing requirements of the Public Health Service increased rapidly with the general expansion of activities. The expenditures for the year, necessarily partly estimated, were as follows: Printing and Binding, Federal Security Agency, \$80,000.77; Disease and Sanitation Investigations, \$53,363.40; Expenses, Division of Venereal Diseases, \$26,873.39; Maintenance, National Cancer Institute, \$14,032.06; Emergency Health and Sanitation Activities, \$6,410.77; Emergency Fund for the President, Allotment to Federal Security Agency, \$1,827.10. The allotment from the general printing appropriation for the Federal Security Agency was largely used for needs which may be regarded almost as fixed charges, such as blank forms, letterheads, post cards, books of regulations, and the weekly Public Health Reports. The expenditures from the other appropriations mentioned also covered blank forms and letterheads for the respective activities, but were chiefly used for bulletins, pamphlets, folders, and other printed matter to disseminate the results of studies and other information for the education of the public in the general promotion of the Nation's health. During the year a new bimonthly periodical entitled "Journal of the National Cancer Institute" was established after approval by the Director of the Bureau of the Budget as required by statute.

Employee activities.—The Public Health Service Federal Credit Union continued to grow during the year. As of June 30, 1941, there were 342 active members. The total savings deposits of the members amounted to \$30,950.95. During the year 284 loans totaling \$29,022.91, were made and a dividend of 4½ percent was declared.

The Public Health Service Relief Association made nine loans totaling \$760 during the year. As of June 30, 1941, total assets of the Association were \$5,308.24.

The Recreation Association continued to function, offering many forms of diversion to the personnel of the Public Health Service, and actively assisting in promoting a cooperative camp for all Government employees in the Catocin Mountains, Md.

ST. ELIZABETHS HOSPITAL

WINFRED OVERHOLSER, Superintendent

It is pleasing to record that the general state of the health of the patients at St. Elizabeths Hospital has been held at a high level, and that no epidemics or other catastrophes have occurred. The physical plant has been developed and maintained in an excellent state of repair, several administrative changes designed to improve the care of the patients have been carried out, and the teaching and research programs have been prosecuted vigorously.

MOVEMENT OF POPULATION

On June 30, 1941, 6,883 patients remained in the hospital as compared with 6,535 on June 30, 1940, an increase of 348.

The total number of patients under treatment during the year was 8,038, as compared with 7,476 during the preceding year, an increase of 562.

The total number of admissions during the year was 1,503, as compared with 1,202 in the preceding year, an increase of 301. With the exception of the year 1919, following the World War, when 1,802 patients were admitted, this is the largest number of admissions recorded in the history of the hospital. Sixty-three of the patients admitted were former patients of St. Elizabeths Hospital, and 86 others were former patients of other mental hospitals, 149 of the patients having had previous hospitalization.

The total number of discharges was 773, as compared with 619 in the preceding year, an increase of 154.

The total number of deaths for the year was 382, as compared with 322 for the preceding year, an increase of 60.

The total number of discharges and deaths, combined, was 1,155, compared with 941 in the previous year, an increase of 214.

There were 65 burials in the hospital cemetery, as compared with 59 during the preceding year, an increase of 6. All honorably discharged service men are entitled to burial in the Arlington National Cemetery. The 317 patients not buried at the hospital or in the Arlington National Cemetery were taken by registered undertakers for burial in other cemeteries.

The daily average of patient population was 6,663, compared with 6,395 during the preceding year, an increase of 268.

Movement of patient population, fiscal year 1941

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1940.....	3, 173	1, 057	4, 230	1, 432	873	2, 305	6, 535
Admitted during year ended June 30, 1941.....	828	206	1, 034	298	171	469	1, 503
Total number under care and treatment during year ended June 30, 1941.....	4, 001	1, 263	5, 264	1, 730	1, 044	2, 774	8, 038
Discharged as:							
Not insane.....	18	2	20	2	-----	2	22
Recovered.....	169	35	204	65	34	99	303
Improved.....	153	29	182	37	16	53	235
Unimproved.....	160	21	181	24	8	32	213
Total discharged.....	500	87	587	128	58	186	773
Died.....	145	78	223	100	59	159	382
Total of patients discharged and dead.....	645	165	810	228	117	345	1, 155
Number of patients remaining on rolls June 30, 1941.....	3, 356	1, 098	4, 454	1, 502	927	2, 429	6, 883

The average number of patients in the hospital for each fiscal year from 1930 to 1941 is as follows:

Fiscal year	Number of patients	Fiscal year	Number of patients
1930.....	4, 390	1936.....	5, 373
1931.....	4, 601	1937.....	5, 538
1932.....	4, 798	1938.....	5, 836
1933.....	5, 036	1939.....	6, 108
1934.....	5, 049	1940.....	6, 395
1935.....	5, 267	1941.....	6, 663

At the close of the year 358 were carried on the rolls on visit as compared with 324 patients on June 30, 1940, an increase of 34 patients.

The admission rate has steadily increased as shown by the following table:

Fiscal year	Total admissions	Total discharged	Percent discharged in relation to admissions	Total deaths
1929.....	756	316	41.80	252
1930.....	706	330	46.76	203
1931.....	851	422	49.59	211
1932.....	858	401	46.74	248
1933.....	911	552	60.59	278
1934.....	894	426	47.65	258
1935.....	824	396	48.06	304
1936.....	925	552	59.68	298
1937.....	1, 099	490	44.59	332
1938.....	1, 029	461	44.80	267
1939.....	1, 056	469	44.41	281
1940.....	1, 202	619	51.50	322
1941.....	1, 503	773	51.43	382

MEDICAL DEPARTMENT

The pressure of routine administrative duties has increased with the increase in number of admissions and population. New patients de-

mand more attention and relatives are more solicitous than in chronic cases.

During the past year 461 patients were presented at general conference, of which 203 were discharged. The total number of discharges during the year was 773. The general attitude of the staff in permitting extended visits for the purpose of rehabilitation in the community has become more generous, the number of visits has increased, and the number of patients carried on visit at the end of the fiscal year has increased slightly to 358 patients. The death rate has increased slightly, the number of deaths during the past year being 382. The annual accumulation of patients has been accelerated, reaching a total of 348 patients, of which a large majority were white men. The increased number of admissions, reaching 1,503, was largely on the white men's receiving service, where 828 patients were admitted during the year. The discharge rate remained approximately the same as last year (51.5 percent), which, however, is quite favorable as compared to the years 1937, 1938, and 1939, in which the discharge rate was approximately 44 percent.

The large amount of court work has been more than enough to occupy the full time of one staff member. There were approximately 49 writs of habeas corpus to which the hospital made returns and each hearing required the presence of two physicians, on an average of two appearances in each case. The amount of time required in connection with these proceedings, many of which border on the legally frivolous, and nearly all of which result in denial of the petition, is inordinate. It is to be hoped that the court procedure can be examined by the justices, with a view to reforming it in a manner which will conserve time while still preserving the constitutional rights of the petitioner. There were also approximately 15 prisoners examined for the court and the district attorney, and 12 mental examinations for the Civil Service Commission.

Of the total deaths during the year, amounting to 382, autopsies were performed in 239 cases, or 62.57 percent.

During the year, on account of the increased number of white male patients, it became necessary to make frequent transfers from the Male Receiving Building to other buildings. The case of each patient was carefully considered with a view of finding the most suitable ward for him, aiming to preclude any complaints on the part of the patients or their relatives because of such transfer. The general plan pursued was to transfer most of the Service cases, younger patients, and those with a more favorable prognosis to appropriate wards on the East Side Service, while most of the civilians and the more prolonged cases were sent to the West Side and Detached Services.

The opening of Continuous Treatment Buildings Nos. 5 and 6 has enabled us to relieve the overcrowded conditions through various wards of the Male Receiving Building, facilitating the distribution and proper classification of newly admitted patients.

Every effort has been made to reduce the number of injuries occurring on the various services. All reports of injuries were carefully checked, discussed with the physicians in charge, and action taken wherever possible to prevent recurrences.

As in former years, special efforts have been made to reduce the number of seclusions and restraints, and I am pleased to state that

these have been reduced to a negligible point. It should be stated that this satisfactory condition with reference to restraints and seclusions is not due to the use of chemical sedation.

As indicated in the annual report a year ago, the results of insulin and metrazol therapy at St. Elizabeths Hospital have not been especially encouraging, and therefore these forms of "shock therapy" have not been actively utilized. An apparatus for electric shock therapy has recently been purchased, and its use will be instituted in the near future.

Among changes made during the past year were:

Ward No. 10 of the Male Receiving Building has been set aside for depressed patients who were quiet and offered good prospects for recovery. A ward for officers has been established in Continuous Treatment Building No. 5 to permit this arrangement. Ward 9, Male Receiving Building, is continued as an officers' ward.

Beech Ward, which was formerly part of the West Side Service, has been turned over to West Lodge Service, to furnish additional beds for the increased number of colored male patients.

Arrangements have been worked out with the War Department for the temporary admission to St. Elizabeths Hospital of patients from Walter Reed General Hospital, because of the overcrowded conditions in that institution. On January 21, 1941, this plan was put into operation, and has continued since then. A total of 188 such patients has been admitted and it is planned to take care of at least 150 such patients in the wards of St. Elizabeths at any one time. Three Army medical officers have been assigned here to assist in caring for these patients as well as to assist in preparing the many reports in connection with the patients' separation from the United States Army. Stenographers from the War Department also are assigned to assist in the paper work peculiar to the military service. Recently a ward for this class of cases has been opened in the Continuous Treatment Service.

Continuous Treatment Building No. 1 was turned over to the Women's Service in December 1940, and the male patients were moved from that building to Continuous Treatment No. 6, a new building which was opened on that date.

Continuous Treatment Building No. 5 was opened in January 1941.

Requests of relatives to have patients write to them are still closely followed, a memorandum being sent to the supervisor whenever a specific request is made, and in a great many cases the patients are urged by one of the physicians to write personally.

One of the rooms in the basement of the Women's Receiving Building has been converted into an office for the Director of Occupational Therapy, a locker room provided, and a storage room built for that department.

M Building was transferred to the Q Service, and the patients from that building were transferred to Continuous Treatment No. 1 Building.

The disturbed patients on Wards B-3 and 4 were transferred to Continuous Treatment No. 1.

The amphitheater of C Building was remodeled into a ward with a capacity of 32 patients. This ward is at present occupied by elderly patients and a full-time occupational therapist has been assigned to this group.

The basements of C and B Buildings have been remodeled as locker and rest rooms for employees.

The occupational therapy shop storage room, formerly in the basement of Toner Building, has been moved and this room remodeled for a locker and rest room for colored employees.

On June 27, 1941, the hospital received 44 patients from the Virgin Islands, 28 of them women and 16 men. These were the first patients admitted from these islands.

Ample recreation and amusements have been available for the patients who are able to leave wards under nominal supervision. The patients enjoy the dances, movies, other special entertainments, baseball games, band concerts, and attendance at church.

During the year 2,223 patients were admitted to the Medical and Surgical Service. This is an increase of 131 admissions over last year.

A similar increase is shown in the work of the clinics. The number of clinic visits during the past year was 45,670, being 2,353 more than during the previous fiscal year.

The patients who passed through the Medical and Surgical Building during the year received 48,777 patient-days of treatment. The average number of days' stay for each patient was 22.4.

A new drug of the sulfonamide group, sulfathiazole, became available last fall for the treatment of pneumonia, supplanting the previous use of sulfapyridine, which in turn had supplanted sulfanilamide. The latest drug has proven to be more efficient than either of the other two.

There was a variety of contagious diseases during the year, but they were kept under control.

The activities of the Surgical Service were again more or less routine. With the acquisition of the Bovie electrosurgical unit, more surgical procedures are being carried out with the electric cutting electrode. The activities of the operating room have increased somewhat during the year.

The work of the anti-luetic, dermatologic, minor surgical, and ophthalmologic clinics very materially increased during the past fiscal year over any previous year.

During the year 20 institutions and physicians, including the Department of Health of Puerto Rico, have been provided with malarial blood for use in the treatment of parietic patients. The Hospital is glad to render such cooperative service to physicians and hospitals.

The institutional podiatrist periodically makes rounds in R Building and Glenside, doing very satisfactory work with the patients requiring such attention.

During the year an assistant pharmacist was added to the pharmacy.

The number of patients treated in the dental clinic was 4,634, and there were 7,536 patient visits.

In the research department of the laboratory the work continued to show marked increases. Members of both the clinical and laboratory staff have taken part in research work. The following studies have been carried out; some of them were completed and formulated in papers:

1. Study of the elimination of phenolphthalein introduced into the cerebrospinal fluid.
2. Biochemical studies in schizophrenic patients and normal controls, namely, analyses of minerals in arterial and venous blood.

3. Electroencephalographic studies: (a) in schizophrenic, general parietic, and epileptic patients, and normal controls; (b) in catatonic patients before and after injection of sodium amytal; (c) cycloscopic analyses of brain waves.

4. Experimental "shock therapies" in cats with insulin and metrazol. A histopathological study. Read at the Annual Meeting of the American Psychiatric Association, Richmond, Va., May 5-9, 1941.

5. Research work upon growth of viruses in chick embryos.

6. Hypochondriacal complaints with special reference to personality and environment. Read at the Annual Meeting of the American Psychiatric Association, Richmond, Va., May 5-9, 1941.

7. Research work on survival of erythrocytes *in vitro*.

8. Research work on wound healing.

9. Research work on growth of ameba.

10. Clinical studies in schizophrenia.

11. Delirium.

12. Hypertension and psychoses.

13. Liver function test in schizophrenic patients.

14. The therapeutic effect of protozyme in neurosyphilis.

15. Research work on the preservation of blood.

Libraries.—The medical library received an addition of 557 books, 111 of which were purchased and the balance were gifts, of which 82 were from the estate of Dr. William A. White. Pamphlets, including reprints and annual reports, are estimated at 5,700. The library received during the past year 86 periodicals and magazines. Total circulation for the year was 1,255. These figures do not include books and periodicals consulted in the library. The hospital borrowed 357 volumes from the Army Medical Library, Library of Congress, etc.

Eight hundred and five volumes were added to the patients' library during the year. Of these, 222 were new books purchased by the hospital, 131 were donated by the Honorable Paul V. McNutt, the balance including large donations from the Public Library and members of the staff. These receipts brought the total number of books on hand to 19,142. Thirty-six popular magazines and five newspapers, daily and Sunday, were regularly received. Five hundred and eighty-seven books were repaired and bound in the patients' bindery, which is located in the library building proper.

Social service.—During the year the total number of patients supervised by the social service was 456. One hundred forty-three histories were obtained; service was rendered for 293 in-patients, and 258 visits were made for surveys preparatory to the contemplated release of patients.

Out-patient service.—It is believed that a psychiatric follow-up clinic should be organized for patients who have been released from St. Elizabeths Hospital. With the generous support of Mrs. Anne Archbold, a member of the Board of Visitors, a start has been made in establishing such an out-patient department on an informal basis, and many of the medical officers have already volunteered to man such a clinic in their hours off duty. It is to be hoped that statutory authority for such an activity may be secured. This lack of an out-patient department is probably the only respect in which the hospital fails to meet the ideal requirements set by the American Psychiatric Association. Also, a neurosyphilis out-patient department is worthy of consideration, because these patients who have had fever therapy and chemotherapy at the hospital can obtain more satisfactory follow-up treatment by continuing under the supervision of the staff members who are familiar with their cases. A

psychiatric out-patient department for the purpose of following patients who have been released from the hospital would not only render a service to the hospital patients but perhaps result in a saving to the District, and possibly a more liberal policy with regard to the release of patients would be feasible if provision should be made for their nominal psychiatric supervision in the community.

Occupational therapy.—Three occupational therapy aides have been added to the staff during the year. Occupational therapy treatments have been given on ward 5, B building; and 300 feet of motion-picture film in color have been taken of this group. Approximately 75 patients have been tried in this group; some have been discontinued because of age, physical disabilities, mental deficiency, and inability to adjust to the active routine. At present there are 20 patients in the group, all except one under 35 years of age.

School of nursing.—There were 63 students enrolled during the fiscal year 1941. In addition, there were 35 affiliate students and 13 postgraduates, a total enrollment of 111.

The Superintendent gave diplomas to 10 postgraduate students in December 1940, and to 13 on June 25, 1941.

The Nurses Examining Board of the District of Columbia has made regular inspections, and advised the hospital that the School of Nursing is fully accredited.

The American Red Cross has been giving first-aid courses to those people in the hospital who desired to take them.

St. Elizabeths Hospital is offering a refresher course to nurses who have been inactive for a number of years, so that they may replace the younger nurses who are enlisting in the defense services.

Red Cross.—On February 3, 1941, the Red Cross House was destroyed by fire. All of the current and closed Red Cross records of the patients were totally destroyed, together with all statistical data. This explains the limited account of this department for the fiscal year. Plans are under way for constructing a new, larger, and more up-to-date building, thoroughly fireproof, with all modern improvements, required by the Red Cross work.

The emphasis in the Red Cross work has been somewhat shifted during the past year, especially since January 1, owing to the Army policy of sending a large number of cases to the hospital which are intended to be transferred elsewhere. The time of the patient's stay is arbitrarily limited and is not dependent in any way on the patient's improvement or recovery.

Another matter which might be noted in connection with psychiatric case work is the introduction of psychodrama. The organization of the work has been technically under Red Cross supervision, with the very generous financial assistance of Mrs. Archbold. A very capable director of the psychodramatic theater is working at the hospital. Psychiatric case workers have, however, worked cooperatively on a number of cases under treatment.

The usual program of movies, baseball and tennis games, boat rides, and the White House lawn party, with trips to baseball games in town, have been continued. The Work Projects Administration has continued its excellent musical program of concerts, dance orchestras, and teaching projects. There have been three shows given by the colored patients. The Indian patients put on a floor show and a stage show in Hitchcock Hall.

During the past year there has been organized and trained at the hospital and at the chapter a group of six "Gray Ladies." These women took several courses, graduated in May 1941, and were given their "Gray Lady" certificates. Five of these "Gray Ladies" have been assisting the librarians in their work.

ADMINISTRATIVE DEPARTMENT—OFFICE OF THE ASSISTANT TO THE
SUPERINTENDENT

Supplies.—The supplies produced on the hospital reservation, farm, garden, and other products, included 297,302 gallons of milk, 173,701 pounds of fresh pork, 9,040 pounds of chicken, 16,749 dozen eggs, and large amounts of vegetables, fruit, hay and fodder.

The shoe shop produced 10,287 pairs of shoes and slippers for men, 2,415 pairs for women, and 16 pairs for children. It repaired 1,553 pairs of shoes and slippers. It produced 1,666 belts.

The mattress shop produced 2,915 mattresses and 2,747 pillows. The broom shop made 6,550 brooms. The brush shop manufactured 3,265 brushes of various classes. In the bakery there were baked 985,335 loaves of bread, 3,734,328 rolls, and 91,794 pounds of pastry. The power plant manufactured 548,884,000 pounds of steam; the electrical department generated 3,739,020 kilowatt-hours of electricity; there were pumped 482,363,000 gallons of water, and the main refrigeration plant produced 7,432 tons of ice and refrigeration. All the steam, electricity, ice, and refrigeration used on the reservation was manufactured by the hospital.

In addition, large quantities of clothing for men and women were made in the sewing rooms, tailor shops, and occupational therapy departments, and many other items were made or repaired in various shops of the hospital.

Dairy barn.—The milk supply has held up exceptionally well during the year, with a total of 297,302 gallons, the highest record in the history of the herd. The daily average for the year was 812 gallons.

During the year 45 old and unserviceable cows have been sold, 14 have died, and 71 heifers have been brought from the lower farm (Goddling Croft) to take their place. Two of the older bulls belonging to the Bureau of Dairying, United States Department of Agriculture, were sold during the year and the proceeds remitted to that Department. This spring one young, pure bred herd sire was purchased, as well as 30 heifers between the ages of 6 and 12 months.

The work that was started last year to control calf scours and calf pneumonia has continued with encouraging results.

Some mastitis has existed in the hospital herd and, until a few months ago, no effective treatment for this disease was known. As a result of experiments conducted at the University of Pennsylvania School of Veterinary Medicine during the past year a treatment has been developed which is more than 80 percent successful. It consists of the injection of colloidal silver oxide, in a mineral oil base, into the udder through the teat canal. This spring, three acute and three chronic cases of mastitis in the hospital herd were treated. The acute cases cleared up after two injections, and the chronic cases showed improvement.

The herd was tested for tuberculosis and was found to be free of the disease. This has been considered an accredited herd for over 30 years.

During the year a new veterinarian was appointed, Dr. Irving G. Cashell, who began work on November 1, 1940, and has been furnishing adequate service. He replaces Dr. John P. Turner, who had been veterinarian at the hospital for almost 40 years and who has always been a most reliable, faithful, and loyal employee.

At the end of the fiscal year the herd of cattle consisted of 85 calves, 116 heifers, 280 cows, and 10 bulls.

Swine herd.—Conditions at the piggery remain unchanged in the main. The department has been functioning smoothly under a new herdsman appointed during the year.

During the fiscal year, 765 hogs were slaughtered, furnishing the hospital with 173,701 pounds of fresh pork, including 2,449 pounds of liver. This was an increase of 21 percent in fresh pork over the previous 10-year average.

From 90 to 100 sows are bred each spring and fall, and for several years we have been able to maintain the herd in this manner without the purchase of feeder pigs. The herd, as of June 30, 1941, consisted of 965 animals and was in a healthy condition.

Poultry plant.—During the calendar year 1940, an exact count was made of eggs laid by the White Leghorn hens and by the New Hampshire Red hens. The records show that the New Hampshire Reds laid more eggs per hen, and that their death rate was lower. Also, they averaged more than a pound heavier per fowl when slaughtered.

On June 30, 1941, the flock consisted of 530 Leghorn hens, 1,100 New Hampshire Red hens, and 1,806 New Hampshire Red young chickens.

During the year the hennery furnished 16,749 dozen eggs and 9,040 pounds of fowl. This was a record production for this department.

The farm at Godding Croft continues to produce corn silage, wheat, and soybean hay for the young stock, timothy hay for the horses, and from 2,500 to 3,000 bushels of ear corn for general use.

The area devoted to the farm and garden is each year being decreased by the construction of new buildings taking up sites formerly devoted to farm and garden, and by the use of farm land for other services of the Government and by the District of Columbia. The Army has already erected radio towers and building; the Navy is now requesting a site for the same purpose. The Army is requesting an additional site to extend broadcasting equipment. The National Capital Park and Planning Commission has requested about 16 acres for the Fort Drive. These are cited as examples of the process of attrition suffered by the farm activities.

Lawns and grounds.—The grounds surrounding Continuous Treatment Buildings Nos. 5 and 6, which have just been completed, were sown with grass seed, and 66 shade and ornamental trees were planted. The lawns and grounds have been kept in their usual excellent condition. Flowers were furnished to the wards on all necessary occasions.

Personnel.—The total number of employees on the hospital rolls on June 30, 1941, was 2,013, an increase of 146 over the previous year. There were 666 appointments during the year, and 520 separations.

During the year 13 employees were retired from the service on account of age and disability. Particular mention is made here of the long and loyal service of Mr. Frank Cornell, who served the Hospital 34 years; Miss Mamie C. Jones, 31 years; Mr. Emory A. Walker, 30 years; Mrs. Ruth A. Brown, 27 years; and Mrs. Grace E. Greer, 25 years.

In addition to the above retirements, Dr. John P. Turner, veterinarian, was separated from the service September 30, 1940, having reached 70 years of age, after 37 years of distinguished service to the Hospital.

There was a 25 percent turnover in the permanent personnel, occurring chiefly in the force of attendants. There were 181 more appointments and 116 more separations during 1941 than in 1940.

As of June 30, 1941, 42 employees were on a furlough status, these employees having entered the military and naval services. With the national emergency growing more acute, the trend towards a larger turnover may be expected to continue.

There was an increase of 350 days of sick leave taken during the calendar year 1940 over the previous year. A total of 10,150 days were granted to 1,080 employees. The average number of days of sick leave for all employees was 5.3, the same as the previous year.

Purchases.—Supplies were ordered in the amount of \$1,450,000. There were 356 special contracts entered into by the hospital, amounting to \$359,165.

Included in the material purchased, for the first time, were uniforms for employees. A provision was included in the appropriation act authorizing a limited amount for the purchase of such uniforms. Regulations were drawn up, directing that certain classes of uniforms be used by employees; the hospital was to furnish uniforms to the male and female attendants, domestic attendants, watch force, fire department force, and kitchen and laundry employees.

Financial office.—During the year disbursements approved through the financial office amounted to \$4,808,106.20, on a total of 3,691 vouchers. Collections received and deposited totaled \$3,340,154.

Chief Clerk's Office.—During the year 1941, 23,084 letters were written in the stenographic office, 20,099 dictaphone cylinders were transcribed, and 1,241 histories pertaining to patients were written.

Fire department.—Regular inspections were made of the hospital by the fire marshal for the purpose of protecting it from fire. On several of his inspection tours he was accompanied by representatives of the District Fire Department. Fire extinguishers were refilled and tops locked. The fire siren and fire-alarm system are tested monthly. The fire pumps at the powerhouse were tested weekly, and the triple combination pumper was tested daily and put in service once a week. Fire drills were held weekly in the various wards of the institution.

During the year there were 34 alarms, the property damage amounting to \$30,380. The largest of these fires destroyed the building built and occupied by the American Red Cross on the hospital reservation. Approximate loss from fires from June 19, 1917, to June 30, 1941, was \$36,614.05, an average of \$1,525 a year.

Continuous Treatment Buildings Nos. 5 and 6.—Continuous Treatment Buildings Nos. 5 and 6 have been completed and are now occupied.

All buildings authorized through the year ending June 30, 1941, have now been completed.

New construction.—In the act making appropriations for the year 1942, Congress authorized construction of two continuous treatment buildings, with a capacity of 400 beds; a building for storeroom and warehouse, including space for a laundry and industrial departments; and a new boiler and generator. Work on these will begin in the near future.

Construction department.—The boundary wall back of the greenhouse, which had been overturned on account of an accumulation of storm water, has been rebuilt.

A concrete walk was built from I Building to the third gate, and from N Building to the steps at the underpass, connecting two parts of the hospital reservation.

A stage was constructed in the basement of Hitchcock Hall in connection with the psychodramatic treatment now given patients.

Continuous Treatment Building No. 1 has been remodeled for the use of women patients.

The old operating section in C Building has been remodeled and converted into a ward for the use of 32 patients.

A woven-wire fence 8 feet high and 2,700 feet long has been erected along the south boundary of the hospital property.

The damage to the roof, windows, doors, and frames of Hitchcock Hall, resulting from the fire which destroyed the Red Cross building, has been repaired.

Electrical department.—The increase in the use of electricity and electrical equipment has materially increased the work of the electrical department at the hospital. Many of the patients provide their own radio sets. The hospital has increased the number of outlets in the various wards of the buildings in order to extend the use to more patients.

Automatic telephone.—The hospital automatic telephone system traffic amounted to 1,696,098 calls during the year, the daily average being 4,647, and the hourly average 194. This represents an increase over the previous year of 10 percent.

Heating and plumbing department.—At pumping station No. 2, chlorine control apparatus was installed for the purpose of chlorinating the hospital water supply. In the creamery additional new equipment was installed, including pasteurizers and circulating pumps. A new heater has been installed in the laundry.

The old reservoir had been temporarily abandoned since the construction of the sewer by the District of Columbia, which left it in bad condition; it has been pumped out and cleaned, and after a thorough inspection is now again in use.

In several of the buildings, such as I, N, and P, new cafeteria serving tables, equipped with coffee and tea urns, were installed for the convenience of the patients.

Regular daily inspections and repairs have been made to the hot-water heaters, thermostatic shower mixing valves, and all heating and plumbing in the hospital.

Guard force.—The guard force has continued in its work, being ready to assist in keeping order and preventing losses whenever called upon. Several investigations were made during the year of reports of minor thefts.

Laundry.—The work of the laundry continues to the same extent as previously reported. Conditions there are so crowded, with the intense heat and humidity in the summer, that working conditions are almost unbearable. Provisions have been made for a new building which will give more room and much better service. The furnishing of uniforms to employees, which will have to be laundered, will materially increase this work.

Several new machines were installed during the year. Four presses and two sleeve forms have been added to the ironing room. Four old washers have been replaced with four new ones, one being slightly larger. Two old and small extractors have been replaced with two large ones.

The number of pieces laundered, dried, and ironed during the year was 14,680,561.

Garage.—The work of the garage continues to increase. The additional number of patients and the improvement in methods of treatment require continuous visiting to the clinics. As the distance from some of the wards to the clinics is approximately a mile, it is necessary to use conveyances, including ambulances and busses, on most of these visits.

The opening of the new buildings, with the increased number of patients requiring additional supplies, increases the work of the delivery trucks.

There has been an increase of approximately 25 percent in the work of this department during the past year.

Culinary department.—Any increase in the number of patients necessarily increases the work of the dietetic force. Over 20,000 meals are furnished each day. The size of the kitchens varies from those furnishing meals to about 400 patients to those serving over 1,500 patients; one serves a total of 2,000 patients.

The Continued Treatment kitchen, which was partly equipped when constructed, has now been fully equipped to take care of the increased number of patients.

As far as possible, the method of feeding patients is being changed from table service to the cafeteria system. With this system the food is hot when served, the patients have some choice of food, and they can sit where they choose at the table.

The dietitians assist in giving courses to the student nurses. One of the dietitians, in addition to her regular work, has conducted two classes in Red Cross nutrition work as part of the national defense program.

The number of persons served daily at the employees' cafeteria has increased to 650, 100 more than a year ago.

Creamery.—During the year the dairy pasteurized 297,302 gallons of milk, a daily average of 814 gallons. About 1,000 quarts were bottled daily, and the remainder was canned for use in the various kitchens and bakery and for making ice cream.

In addition to the milk produced at the hospital, 45,500 gallons of pasteurized milk were purchased. A total of 31,482 gallons of skimmed milk was received from the Department of Agriculture farm at Beltsville, Md., and was used in cooking. The total milk used at the hospital was 374,284 gallons.

An average of 25 gallons of buttermilk was made daily. The ice cream department manufactured 26,691 gallons of ice cream, a daily average of 73 gallons.

NEW LEGISLATION

There is an act before Congress to authorize the Federal Security Administrator to accept gifts for St. Elizabeths Hospital, and to provide for the administration of such gifts. This bill has received the approval of the House of Representatives and the Senate. Several minor amendments were added in the Senate, and the bill was referred to the House for further action. It is anticipated that the bill will become law in the near future.

An act was introduced in Congress to provide for admission to St. Elizabeths Hospital of insane persons belonging to the foreign service of the United States. This bill has received the approval of the House and Senate; several minor amendments were made in the Senate and it was referred to the House for action. It is anticipated that this bill will become law in the near future.

Legislation has been enacted permitting the admission of citizens of the Virgin Islands, who are nationals of the United States, to St. Elizabeths Hospital for treatment, and 44 such patients have been received.

Similar legislation should be enacted looking toward the treatment of the white mentally ill in the Philippine Islands, since no provision has been made for citizens of the United States who may require mental treatment in those islands, and whose State residence cannot be determined.

Legislation is recommended to give expatriated American citizens, who may become mentally ill in other countries, the right to be received in St. Elizabeths Hospital for treatment when their State residence is not known. Similar legislation exists in reference to American citizens residing in Canada.

It is suggested that in the near future legislation be secured permitting what is known as family care of the patients of the hospital. This would permit the transfer, under hospital supervision and direction, of patients to families in the neighborhood, particularly in the rural districts, to work on farms, the hospital paying a small amount for the support and care of such patients. The hospital social workers would make regular inspections, as the patients would continue to be under hospital jurisdiction.

NEEDS OF THE HOSPITAL

An estimate of \$1,388,700 for the support, clothing, and treatment of patients in St. Elizabeths Hospital for the fiscal year ending June 30, 1943, is recommended. This is \$118,700 more than was appropriated for 1942, and is based on an average of 2,100 patients at the same per capita rate of \$1.80 per day, or \$657.00 per annum, and, in addition, the amount of \$10,000, which is part of the amount added to the last appropriation bill by Congress for the purchase of uniforms for employees. During the year 1941 there was an average of 2,117 patients chargeable to the Federal Security Agency appropriation on the rolls. The number estimated, in view of these facts, is

conservative. There was an increase of 348 patients in the hospital on June 30, 1941, as on the same day of the previous year, and it is conservatively estimated that the number to be provided for during 1943 will be 7,104.

Included in the estimate is \$185,000 for repairs and improvements to buildings and grounds, the same amount as has been included in the past several years. Out of this sum must come funds for keeping the various buildings in repair, including plumbing, heating, steam-fitting, plastering, painting, flooring, and for the repair and widening of roads and walks.

The estimate for administrative traveling expense of \$1,000 is deducted from the appropriation, to be included in the estimate by the Administrator of the Federal Security Agency under whose direction any expenditure out of this sum shall be made.

There is an estimate of \$2,700,000 for 1,600 additional beds in three 5-story buildings. Admissions are increasing and there is still a shortage of beds. The enlargement of the service branches of the Government—the Army, Navy, and Marine Corps—increases materially the number of those who are eligible for mental treatment in St. Elizabeths Hospital. The number provided for in the last appropriation act will hardly be sufficient to meet the increase that will be received during the present fiscal year. The number of members of the Army who require mental treatment is increasing at a rapid rate. This rate of increase will be magnified if hostilities develop. Walter Reed Hospital is crowded and does not have sufficient beds to take care of those who require treatment. Arrangements have been made with the War Department to receive members of the military forces in much larger numbers, and efforts are then made to return them for treatment to the State where they claim residence. The number received from the Army during the past year increased from 53 to 224. The total admissions in the hospital increased from 1,202 in 1940 to 1,503 in 1941. The future is uncertain; it is certain that the present estimates are highly conservative.

St. Elizabeths Hospital has 7 ward buildings, a kitchen and dining room, known as the semipermanent group, housing over 500 patients, built in 1918, which should be replaced. When these buildings were erected it was estimated they would have a life of 15 years. They have now been in use more than 20 years, and are a serious fire menace. They are in need of gross repairs, which will be costly. Even when repairs are made the buildings will hardly be in condition to house patients. Every effort should be made to replace them at the earliest possible date.

The three buildings for which estimates have been made are 5 stories in height, each to contain about 534 patients, or 1,602 beds in all. The advantage in constructing 5-story buildings is of special consideration owing to the limited ground space available in the hospital for new buildings. The former practice was to erect 2-story buildings, each to house 200 beds. It would require eight such buildings to furnish the same number of beds that will be provided in the three 5-story buildings. The estimate for each of the 2-story buildings was \$350,000, or \$2,800,000 for eight, while the estimate for the three 5-story buildings is \$2,700,000.

There is an estimate of \$785,000 to purchase farm land, to construct buildings to house patients who would work on the farm, to construct

buildings to house employees, for the farm animals, including dairy, piggery, poultry plant, a building for pasteurizing milk, making ice cream, and other necessary farm buildings, including expenditures for preparation of plans and specifications, advertising, and supervision of construction.

The hospital consists of four plots of land, in all about 800 acres. The last land for hospital use was purchased in 1891. At that time the hospital had about 1,500 patients, and over 600 acres were used for farm and garden purposes. The hospital, while originally some miles from the center of the city, is now in the midst of a densely populated section. The dairy and piggery are in proximity to buildings occupied by patients, and the dairy barn is adjacent to Nichols Avenue, a thoroughfare running through this section of the city, both the dairy and piggery being the subject of much justified complaint on the part of the inhabitants of this section.

One part of the farm is located about half a mile from the main site, in what is known as Congress Heights. Certain groups have recommended that a portion of this ground be turned over to the National Capital Park and Planning Commission for playgrounds for children, and that another part be turned over to the District of Columbia for streets and roads. Parts of this same site have been taken by the city for widening streets. Application is on file at the present time requesting permission to run open drains through this land from three points of entrance, to take care of drainage water. It will readily be seen that the hospital must oppose all taking of land until additional land is obtained.

Another plot belonging to the hospital is about four and a half miles from Washington; a portion of it is on low land, sometimes under water.

It is believed desirable to obtain approximately 2,000 acres of land, to concentrate all farm projects in one place, increase the size of the dairy herd, the piggery, and the poultry farm, and build about 6 cottages, housing 40 patients each, on this site. This arrangement would permit an increased number of patients to derive the therapeutic benefits of healthful outdoor occupation. It would also prove an economic arrangement, in that the hospital would be able to secure sufficient milk for all purposes, to increase the quantity of pork products and probably to cure pork products, thus reducing the quantity of ham, bacon, and shoulder to be purchased, and also increase the quantity of poultry products, such as fowl and eggs. Furthermore, the removal of the farming activities from the Nichols Avenue site would make available a considerable area of valuable land which could be used for further buildings and for other activities closely related to the immediate problem of the care of patients.

The hospital has no particular site in view, but preliminary studies indicate that such a site could be secured within from 10 to 20 miles of the main plant.

STAFF CHANGES JULY 1, 1940, TO JUNE 30, 1941

The following appointments were made during the year:

Internes: Howard A. Hoffman, Otis R. Farley, Stanley L. Olinick, Edmund Ziman, Ben D. Chinn, and Roger E. Henning.

Psychiatric residents: Robert H. Groh, Alfred K. Baur, Alan M. Drummond, Herbert X. Spiegel, Abraham Tauber, Lester L. Burtnick, Maier I. Tuchler, and Laura E. Henning.

The following resignations took effect during the year:

Assistant medical officers: Laura E. Ehrlich, George N. Thompson, Jr., and Leslie H. Farber.

Internes: Ewin S. Chappell, Charles Silverberg, Robert C. Hecker, Vincent Marchese, and Harold E. Ratcliffe.

Psychiatric residents: John E. Miksicek, Charles S. Mullin, Jr., Joseph L. Morrow, and Robert H. Groh.

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Hall, Roscoe W., Director of Clinical Psychiatry:

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A Study of Specific Data in the Lives of 183 Veterans Admitted to Saint Elizabeths Hospital. *War Med.*, 1: 387-391, May 1941. (With A. Simon and M. Hagan.)

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Earle, Elizabeth C., Educational Director, School of Nursing:

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Caldwell, Capt. John M., Jr., Army Liaison Officer:

Schizophrenic Psychoses. Amer. J. Psychiat., 97:1061-1072, March 1941.

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APPENDIX A

FINANCIAL STATEMENT

The following is a statement of expenditures from appropriations of the Public Health Service for the fiscal year 1940:

STATEMENT OF NET TOTAL OBLIGATIONS

Appropriation	Appropriated	Received by transfer	Re-serve	Available for obligation	Expenditures		Unobligated balance
					Direct obligations	Transfer to other appropriations	
Salaries, office of Surgeon General..	\$285,400			\$285,400	\$282,250	¹ \$1,200	\$1,950
Pay, etc., commissioned officers..	2,082,640	² \$366,649	\$8,000	2,441,289	2,420,893		20,396
Pay of acting assistant surgeons..	323,300			323,300	320,618		2,682
Pay of other employees..	1,021,500		10,000	1,011,500	1,006,207		5,293
Miscellaneous and contingent expenses	56,000	³ 36,000		92,000	90,052	⁴ 360	1,588
Maintenance National Institute of Health	141,000			141,000	139,804		1,196
Pay of personnel and maintenance of hospitals..	7,362,000	⁵ 2,612,030	200,000	9,774,030	9,720,132	⁶ 11,260	42,638
Quarantine service..	280,000	⁷ 27,209		307,209	291,803		15,406
Preventing spread of epidemic diseases	380,700		12,000	368,700	351,867		16,833
Interstate quarantine service..	35,800			35,800	34,184		1,616
Control of biologic products..	52,500			52,500	52,385		115
Expenses:							
Division of Venereal Disease..	6,200,000	⁸ 190,852		6,390,852	6,132,856	⁹ 98,000	¹⁰ 159,996
Division of Mental Hygiene..	1,438,500		80,000	1,358,500	1,336,244	¹¹ 15,000	7,256
Disease and sanitation investigations	1,625,000			1,625,000	1,455,541	¹² 155,000	14,459
Maintenance, National Cancer Institute	570,000		20,000	550,000	543,027	¹³ 2,000	4,973
Working capital fund..		¹⁴ 201,432		201,432	147,877		53,555
Emergency health and sanitation..	525,000			525,000	509,608		15,392
Total	22,379,340	3,434,172	330,000	25,483,512	24,835,348	282,820	365,344
Grants to States, Social Security Act..	11,000,000	¹⁵ 222,115		11,222,115	10,722,115		¹⁶ 500,000

¹ \$1,200 transferred to Post Office Department.

² \$100,747 from Justice Department; \$155,000 from Disease and Sanitation; \$98,000 from Expenses, Division of Venereal Diseases; \$4,614 from Employees Compensation Commission; \$4,501 from Coast and Geodetic Survey; \$3,787 from Pan American Sanitary Bureau.

³ \$10,000 from Justice Department; \$16,000 from Medical and Hospital Service; \$10,000 from Pay of Personnel and Maintenance of Hospitals.

⁴ \$360 transferred to Post Office Department.

⁵ \$50,000 from Department of Justice; \$1,085,075 Veterans Administration; \$364,797 Civilian Conservation Corps; \$1,407 Allied Soldiers; \$43,490 U. S. Army; \$18,543 U. S. Navy; \$25,455 Coast Guard Dependents; \$1,102 Coast and Geodetic Survey; \$36,284 Employees Compensation Commission; \$3,600 Farm Credit Administration; \$920 Interior Department; \$4,735 Labor Department; \$47,207 Maritime Service; \$1,355 Office of Production Management; \$1,800 Securities and Exchange Commission; \$513 Utilities (California); \$7,242 medical supplies; \$4,000 dental supplies; \$912,095 from Work Projects Administration; \$1,800 Accounts and Deposits; \$610 Wage and Hour Division.

⁶ \$1,260 to Post Office Department; \$10,000 to Miscellaneous and Contingent Expenses.

⁷ \$709 from Coast Guard; \$263 War Department; \$6,704 Justice Department; \$160 Navy Department; \$19,373 from Immigration Service.

⁸ \$190,852 from fiscal year 1940.

⁹ \$95,000 to Pay, etc., Commissioned Officers.

¹⁰ \$158,433 to fiscal year 1942.

¹¹ \$15,000 to Working Capital Fund.

¹² \$155,000 to Pay, etc., Commissioned Officers.

¹³ \$2,000 to Department of Commerce.

¹⁴ \$15,000 from Expenses Mental Hygiene Division; balance, July 1, 1940, \$53,262; earnings, \$133,170.

¹⁵ \$222,115 transferred from fiscal year 1940.

¹⁶ \$500,000 transferred to fiscal year 1941.

FUNDS MADE AVAILABLE FROM OTHER SOURCES

	Available	Direct	Transfer to appropriations	Balance
Medical and hospital service.....	\$728,616	\$711,232	¹ \$16,000	\$1,384
Maintenance and improvement of rivers and harbors.....	232,000	209,998	-----	² 22,002
Cooperation American Republics.....	45,000	40,959	-----	4,041
Emergency fund for the President.....	10,000	8,615	-----	1,385
Printing and binding.....	94,287	92,287	-----	2,000
Appreciation foreign currencies.....	34,000	31,244	-----	2,756
Emergency relief.....	200,000	187,117	-----	12,883
Total.....	1,343,903	1,281,452	16,000	46,451

¹ \$16,000 transferred to Miscellaneous and Contingent Expenses, 1941.² \$10,965 transferred to fiscal year 1942.

MISCELLANEOUS RECEIPTS

Source	Amount
General fund receipts:	
Quarantine charges.....	\$173,826.16
Hospital charges and expenses.....	125,570.26
Sale of subsistence.....	21,177.66
Sale of occupational therapy products.....	792.23
Sale of obsolete, condemned, and unserviceable equipment.....	7,863.81
Rents.....	9,422.20
Reimbursement for Government property lost or damaged.....	554.05
Telephone commissions.....	3,318.65
Sale of refuse, etc.....	4,208.86
Sale of livestock and livestock products.....	1,647.11
Other revenues.....	1,198.80
Quarters, subsistence, and laundry.....	375.47
Total.....	349,955.26
Trust fund receipts:	
Sale of effects of deceased patients.....	3,029.91
Inmates' funds.....	63,888.02
Grand total.....	416,873.19

QUARANTINE SERVICE—EXPENDITURES BY STATIONS

Name of station	Pay of officers and employees	Maintenance	Total
Ajo, Ariz.....	\$600.00	-----	\$600.00
Albany, Ga.....	83.33	\$8.55	91.88
Baltimore, Md.....	41,621.05	36,215.54	77,836.59
Biscayne Bay (Miami), Fla.....	50,145.39	19,000.00	69,145.39
Boca Grande, Fla.....	1,225.00	61.08	1,286.08
Boston (Gallops Island), Mass.....	40,394.92	39,214.80	79,609.72
Brownsville, Tex.....	10,991.16	3,400.00	14,391.16
Brunswick, Ga.....	900.00	-----	900.00
Buffalo, N. Y.....	-----	79.17	79.17
Calais, Maine.....	1,200.00	-----	1,200.00
Calexico, Calif.....	1,080.00	-----	1,080.00
Cape Fear (Southport), N. C.....	5,419.92	274.94	5,694.86
Charleston, S. C.....	25,154.00	7,620.00	32,774.00
Charlestown, Mass.....	-----	12.00	12.00
Chelsea, Mass.....	-----	11.40	11.40
Columbia River (Astoria), Oreg.....	1,815.00	26.95	1,841.95
Corpus Christie, Tex.....	3,780.00	-----	3,780.00
Del Rio, Tex.....	4,590.00	700.86	5,290.86
Douglas, Ariz.....	1,200.00	-----	1,200.00
Eagle Pass, Tex.....	5,970.00	414.32	6,384.32
El Paso, Tex.....	27,357.17	2,650.79	30,007.96
Eureka, Calif.....	1,040.00	9.00	1,049.00
Fall River, Mass.....	1,342.74	22.50	1,365.24
Fernandina, Fla.....	15.00	-----	15.00
Fort Fairfield, Maine.....	240.00	-----	240.00
Fort Lauderdale, Fla.....	-----	59.95	59.95
Freeport, Tex.....	450.00	-----	450.00
Galveston, Tex.....	21,892.07	9,200.00	31,092.07
Gloucester, Mass.....	1,650.00	-----	1,650.00
Gulfport, Miss.....	7,399.92	2,169.24	9,569.16
Hidalgo, Tex.....	7,640.46	502.50	8,142.96

QUARANTINE SERVICE—EXPENDITURES BY STATIONS

Name of station	Pay of officers and employees	Maintenance	Total
Houlton, Maine.....	999.96		999.96
Key West, Fla.....	3,600.00	209.64	3,809.64
Laredo, Tex.....	20,447.15	796.35	21,243.50
Lewes, Del.....	1,100.00		1,100.00
Los Angeles Terminal Island.....	39,907.87	5,299.21	45,207.08
Merced, Tex.....	1,510.00	633.00	2,143.00
Mobile, Ala.....	20,223.60	15,387.00	35,610.60
Monterey, Calif.....	149.92		149.92
Morehead City, N. C.....	90.00		90.00
Naco, Ariz.....	1,791.04	44.00	1,835.04
New Bedford, Mass.....	600.00		600.00
New Orleans, La.....	63,497.95	14,410.00	77,907.95
Newport News, Va.....	930.00		930.00
New York (Rosebank), N. Y.....	169,205.27	32,660.00	201,865.27
New York, N. Y.....	3,466.55	348.85	3,815.40
Niagara Falls, N. Y.....	4,099.50		4,099.50
Nogales, Ariz.....	4,725.00	120.59	4,845.59
Norfolk (Fort Monroe), Va.....	27,754.34	5,320.00	33,074.34
Northport, Wash.....	600.00		600.00
Ogdensburg, N. Y.....	450.00		450.00
Pascagoula, Miss.....	1,200.00		1,200.00
Pensacola, Fla.....	5,644.92	74.74	5,719.66
Perth Amboy, N. J.....	1,980.00	550.00	2,530.00
Philadelphia, Pa.....	48,887.68	11,213.37	60,101.05
Port Angeles, Wash.....	1,087.50		1,087.50
Port Aransas, Tex.....	75.00	1.89	76.89
Portland, Maine.....	6,525.84	664.05	7,189.89
Portland, Oreg.....	10,633.00	1,525.14	12,158.14
Port St. Joe, Fla.....	30.00		30.00
Port Townsend, Wash.....	1,200.00		1,200.00
Presidio, Tex.....	2,796.68		2,796.68
Providence, R. I.....	2,262.47	525.00	2,787.47
Rio Grande, Tex.....	2,326.66	76.68	2,403.34
Rochester, N. Y.....	1,500.00		1,500.00
Roma, Tex.....	3,120.00	615.97	3,735.97
Rouses Point, N. Y.....	229.00		229.00
Sabine, Tex.....	18,307.26	6,805.00	25,112.26
San Antonio, Tex.....	675.00		675.00
South Bend, Wash.....	650.00		650.00
St. Andrews (Panama City), Fla.....	1,500.00	44.00	1,544.00
St. George Sound, Fla.....	193.33		193.33
St. Johns River (Jacksonville), Fla.....	8,085.84	2,840.00	10,925.84
San Diego (Point Loma), Calif.....	12,490.04	1,869.91	14,359.95
San Francisco, Calif.....	50,783.65	18,510.57	69,294.22
San Ysidro, Calif.....	3,600.00	77.90	3,677.90
Savannah, Ga.....	7,312.24	985.98	8,298.22
Seattle, Wash.....	9,900.00	353.88	10,253.88
Sinnas, Wash.....		15.74	15.74
Tucson, Ariz.....	1,500.00	9.93	1,509.93
Van Buren, Maine.....	50.00		50.00
West Palm Beach, Fla.....	1,259.00		1,259.00
Wilmington, Del.....	550.00	14.69	564.69
Tampa, Fla.....	18,780.00	3,800.68	22,580.68
Zapata, Tex.....	1,740.00	332.16	2,072.16
Ysleta, Tex.....		30.00	30.00
Freight and miscellaneous.....		27,007.12	27,007.12
Total.....	857,220.39	274,826.63	1,132,047.02
INSULAR QUARANTINE STATIONS			
Alaska.....	464.13		464.13
Hawaii.....	36,203.60	6,888.31	43,091.91
Philippine Islands.....	21,625.92		21,625.92
Puerto Rico.....	46,678.60	9,912.69	56,591.29
Virgin Islands.....	9,354.92	175.37	9,530.29
Total.....	114,327.17	16,976.37	131,303.54
Grand total, all stations.....	971,547.56	291,803.00	1,263,350.56

APPENDIX B

AN AGREEMENT BY THE WAR AND NAVY DEPARTMENTS, THE FEDERAL SECURITY AGENCY, AND STATE HEALTH DEPARTMENTS ON MEASURES FOR THE CONTROL OF THE VENEREAL DISEASES IN AREAS WHERE ARMED FORCES OR NATIONAL DEFENSE EMPLOYEES ARE CONCENTRATED ¹

It is recognized that the following services should be developed by State and local health and police authorities in cooperation with the Medical Corps of the United States Army, the Bureau of Medicine and Surgery of the United States Navy, the United States Public Health Service, and interested voluntary organizations:

1. Early diagnosis and adequate treatment by the Army and the Navy of enlisted personnel infected with the venereal diseases.

2. Early diagnosis and treatment of the civilian population by the local health department.

3. When authentic information can be obtained as to the probable source of venereal disease infection of military or naval personnel,² the facts will be reported by medical officers of the Army or Navy to the State or local health authorities as may be required. If additional authentic information is available as to extramarital contacts with diseased military or naval personnel during the communicable stage, this should also be reported.

4. All contacts of enlisted men with infected civilians to be reported to the medical officers in charge of the Army and Navy by the local or State health authorities.

5. Recalcitrant infected persons with communicable syphilis or gonorrhea to be forcibly isolated during the period of communicability; in civilian populations, it is the duty of the local health authorities to obtain the assistance of the local police authorities in enforcing such isolation.

6. Decrease as far as possible the opportunities for contacts with infected persons. The local police department is responsible for the repression of commercialized and clandestine prostitution. The local health departments, the State Health Department, the Public Health Service, the Army, and the Navy will cooperate with the local police authorities in repressing prostitution.

7. An aggressive program of education both among enlisted personnel and the civilian population regarding the dangers of the venereal diseases, the methods for preventing these infections, and the steps which should be taken if a person suspects that he is infected.

8. The local police and health authorities, the State Department of Health, the Public Health Service, the Army, and the Navy desire the assistance of representatives of the American Social Hygiene Association or affiliated social hygiene societies or other voluntary welfare organizations or groups in developing and stimulating public support for the above measures.

¹ Adopted by the Conference of State and Territorial Health Officers, May 7-13, 1940.

² Familial contacts with naval patients will not be reported.



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